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USSR Report

TRANSPORTATION

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CIVIL AVIATION

DIRECTOR ON INSTITUTE'S CIVIL AVIATION PROJECTS

Moscow VOZDUSHNYY TRANSPORT in Russian 30 Oct 84 p 2

[Article by R. Sakach, director of the GosNII GA [State Scientific Research Institute of Civil Aviation], doctor of technical sciences and professor: "Both Theory and Practice"]

[Text] Like all the Soviet people these days, civil aviation employees, including the sector's scientists, are closely studying the materials of the CPSU Central Committee's October Plenum, which examined the question "On the Long-Range Program for Reclamation and Improvement in Efficient Use of Reclaimed Lands Aimed at Steadily Increasing the Country's Food Resources."

"The problems raised by experience on the path of transforming agriculture into a highly developed sector of the economy," said Comrade K.U. Chernenko, general secretary of the CPSU Central Committee and chairman of the Presidium of the USSR Supreme Soviet, "demand new, more effective solutions. And this involves not a rearrangement in the emphasis of our directives, but a search for really innovative and creative approaches."

True innovation and creativity, today as never before, are precisely those characteristics which should be defined by the activity of the sector's scientists, who have been called upon to make a worthy contribution to implementation of the decisions of the CPSU Central Committee's October Plenum.

A good example of carrying out a comprehensive approach is the conduct of flight research operations for the new An-3 agricultural aircraft. Beginning with the development of technical requirements for this aircraft and up to its evaluation in flight trials, the GosNII GA directed these operations in close collaboration with Krasnodar scientists in agricultural aviation. In the process, it is planned to resolve the tasks set for improving the organization and management of research in the field of PANKh [aircraft use in the national economy], for increasing the effectiveness of its results, and for providing a comprehensive approach to the tests and introduction of aircraft technology by the following means.

Utilizing our institute's close ties with airplane and helicopter manufacturing OKB's [experimental design bureaus], we plan to expand our interrelations for the aircraft that are being developed and operated and to include without

fail the problems of special equipment for operations in the national economy for continuing examination.

The units of equipment for conducting different types of airborne operations for agriculture are most important here. It is necessary to improve them and to develop new, more productive types of equipment for handling liquid and powdered chemicals, as well as for biological preparations (for trichogramma and others). Active work with industry on agricultural equipment will require of us not only development of the technical requirements for it, but a specific demonstration of industrial methods of solution based on our experimental design operations conducted in the Krasnodar branch of the GosNII GA.

Today there is a long list of new and modernized airborne agricultural equipment which has undergone acceptance tests, been checked under operational conditions, and been recommended for series manufacture, but which has not been accommodated at plants.

The manufacture of equipment for the An-2 aircraft for dispersal of the trichogramma is most urgent. Production of the trichogramma and other biological preparations in the country has been mastered and is being increased, and the only highly productive method of applying it is by air, but series production of the equipment for this is lacking. This problem must be resolved quickly.

The Ministry of Civil Aviation's Main Administration for Air and Ground Production Equipment Orders (GUZSANT MGA) should display greater activity and persistence in handling orders for sprayers and dusters modified for An-2 aircraft, for rotary liquid atomizers for the An-2 and the Ka-26 helicopter, and also multipurpose spraying equipment for the An-2 aircraft.

It must be said that far from everything has been worked out by the Ministry of the Aviation Industry in equipping aircraft, and especially helicopters, with different accessories for carrying out a number of specific types of operations. Operations, for example, such as airborne cargo drops, transport of different substances that are especially packaged and items that are suspended externally, and a number of other operations. Fitting out aircraft with the necessary equipment is an important and responsible task of the GosNII GA.

In the stages of testing new aircraft technology we plan to conduct the work so that the experienced test pilots and testing engineers of our institute evaluate all the possible uses of aircraft for high performance and full value based on the well-equipped monitoring and recording devices of the test flight complex laboratories. We will be conducting further analysis with the use of automated systems for processing the flight test data, which make it possible to thoroughly interpret tape recordings in short periods of time.

We began monitoring tests on the new Mi-26 helicopter in accordance with precisely such a plan in July this year. This same year we will begin conducting a number of tests with the Ka-32 helicopter, which should be widely used in the national economy, including for ice reconnaissance from ship decks (the shipboard version).

There are many complex problems in research to determine the prospects for aircraft operations in the national economy. This also involves the task of increasing work efficiency, and the conversion to fuel gas, and finally, the application of new types of aircraft which make use of aerostatic lift (airships, rotor-assisted balloons [vertostaty], and so forth).

Economists of the institute and its Krasnodar branch should help to realize all the benefits of a shift in planning the use of aircraft in the national economy with hours adjusted for the real end results of operations in the coming years. This is both a system of planning and wages in accordance with the number of hectares treated by aircraft in agriculture, and it is also the number of ton-kilometers accumulated in helicopter use.

New systems of planning, accounting and incentive can be worked out well only with the close collaboration of science and production, and for this reason we will be conducting a number of scientific and practical operations in this direction with the use of area laboratories in Belorussia, the Non-Chernozem Zone and Central Asia, where, in particular, large-scale land reclamation operations will be continued in accordance with the decisions of the CPSU Central Committee's October Plenum.

Promoting subjects connected with fulfillment of the country's Food Program is one of the important tasks of the sector's scientists. In this plan, along with the traditional directions of operations to develop new, more productive technology and agricultural equipment, introduction of advanced aircraft technologies and improvement in the system of planning indicators for airborne chemical operations, wages and incentives, we can now speak about a completely new field for using aircraft in agriculture--establishment of a system for aerial observation of crop conditions on our country's fields.

With this objective, technical requirements for developing an aircraft designed to conduct overall surveys of the earth's surface by methods of utilizing long-distance probes for nonphotographic mapping have been developed by GosNII GA staff members in collaboration with institutes of the USSR Ministry of Agriculture, which will provide a solution to the production and experimental tasks of agricultural production.

Such an aircraft has been built. It is the Tu-134SKh [SKh: agricultural], in the tests of which the institute is taking an active part. The navigational equipment installed in the aircraft makes it possible to completely automate the aerial mapping process, and the high productivity of the mapping apparatus enables a small number of Tu-134SKh aircraft to monitor the status of crops on the fields of the entire country, including the reclaimed lands.

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CIVIL AVIATION

DESIGNER ON 'AEROFLOT' AUTOMATED COMMO SYSTEM DEVELOPMENT

Moscow VOZDUSHNYY TRANSPORT in Russian 17 Nov 84 p 3

[Interview with Igor' Borisovich Petyashin, chief designer of the "Aeroflot" automated communications system, by O. Goncharova, correspondent of the sectorial press center: "Radio Communications Will Be Conducted Electronically"]

> [Text] The country's first automated communications system, 'Aeroflot,' is now being developed. We are publishing a conversation held with I. B. Petyashin, the system's chief designer, by a correspondent of the sectorial press center.

[Question] Igor' Borisovich, automated control systems have been widely used in civil aviation over the past 10 years. The 'Sirena-2' is being used for ticket sales and seat reservations, and 'Start' is being used for automation of air traffic control. Why has it been necessary to create the 'Aeroflot' communications system?

[Answer] There are several million aircraft departures in our country in a year. Air traffic density on the Moscow, Rostov and Kiev routes reaches over 100 flights hourly. The volume of data received from aircraft and being transmitted to them has increased significantly, and it cannot be handled without the aid of computers. Under such conditions, it became necessary long ago to develop a fundamentally new communications system which provides automation for the process of data exchange between the aircraft and ground services of civil aviation.

[Question] What is the basic purpose of this system?

[Answer] In accordance with its designation, 'Aeroflot' is a system for the collection and distribution of data with a multilevel structure, each level of which is intended for preliminary processing of the data. On the first level, the airborne communications unit will perform the initial collection and processing of flight information and transmit it to the ground communications center. On the second level, the data will come in from a group of aircraft accommodated by a given digital line. On the third level, the data coming in at the message switching center will be processed and distributed among the civil aviation ground services.

Use of the system will enable us to exchange different information not by means of voice telephone communication, which is not very acceptable now, but in automated or automatic forms of data transmittal. For automation of the system with a computer, data will be transmitted in a 'language' compatible with the computer, that is, in a form of coded combinations which represent digits, letters and commands. According to preliminary evaluations, introduction of digital communication will make it possible to reduce the volume of radiotelephone voice traffic by 80 percent, which will make the work of the airport's controllers significantly easier and reduce the workload of an aircraft crew in flight. At the same time, efficiency in data exchange will be increased and the quality and reliability of communications will be improved.

[Question] How will introduction of the new communications system be reflected in the quality of passenger service?

[Answer] Ground-based technical facilities, with the aid of radio transmitting and receiving centers, will establish uninterrupted radio communication throughout the air traffic control zone. In the range of the system's operation, 40 aircraft will be located in the airport traffic area and 300 on the airway simultaneously, which will significantly increase flight performance and route capacity, and will reduce aircraft downtimes and the number of departure cancellations because of poor weather conditions. Passenger service on the aircraft also will be improved. During the flight, additional services will be made available for ticket reservations, hotel accommodations, taxi service, and sending telegrams, and in the future passengers will have the opportunity to converse with subscribers on the ground.

[Question] A few words about similar systems abroad, please.

[Answer] In the United States, operation of a system of information exchange with an address request has been begun. In contrast to the 'Aeroflot' communications system, it does not provide for transmittal of information on flight performance and air traffic control, but is used basically for inquiry and commercial information for an airline's interests. The countries of Western Europe also are oriented toward a similar system.

[Question] And a final question, Igor' Borisovich: when and where will the 'Aeroflot' system begin operating in our country?

[Answer] The system under development is very complex, and its introduction is linked with the development of a number of technical facilities. It is proposed to put this system in operation in the 12th Five-Year Plan. Practical application of the system will become a prerequisite for establishing a unified automated system of air communications for civil aviation.

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TESTING SOLUTION FOR IL-76 BRAKING SYSTEM PROBLEM

Moscow VOZDUSHNYY TRANSPORT in Russian 30 Aug 84 p 3

[Article by V. Lamzutov: "Testing Continues: Rain or Shine"]

[Text] I became a participant in the final stage of a complicated and critical program. Accompanying us on the flight, G. Demenko, chief of the Flight Testing Unit of the State Scientific Research Institute for Civil Aviation spoke of the program's importance.

The interior of our "flying truck" was spacious in spite of the monitoring/recording unit it housed. Near the equipment were operator V. Shumanskiy and engineer V. Gerasimov. Acquainting me with what the test team had to do today, was Candidate of Technical Sciences G. Syusyakalov, senior engineer for the IL-76 aircraft.

"The program we are about to complete," he said, "stems from the fact that in the North, landing gear buffeting was noted on landing with a low aircraft weight. Specifically, this involved 'flying trucks' returning to Tyumen and Krasnoyarsk with only a safe fuel reserve after having delivered their cargo in the Far North.

"The reason behind the landing gear buffeting during landing was discovered during the course of experimental flights: the automatic braking unit was 'at fault.' Now it has been adjusted according to our recommendations and we have to test how the unit behaves on a runway under various landing conditions and what kind of braking performance it gives.

"As of now we have given pilots recommendations on how to fly the aircraft so as to avoid the buffeting and how to combat the buffeting should it arise."

After my discussion with the engineer I climbed to the second level and into the spacious pilots' cabin which was lit by bright sunshine.

The left seat was occupied by USSR honored pilot, M. Kuznetsov, flight testing unit deputy director for flight operations. The copilot was experienced test pilot V. Plume. Just behind them, in the center, sat flight engineer S. Sadikova. Next to her was radio operator V. Gerasimov. The aircraft's first level with its glass compartment was occupied by the navigator, I. Abdulaev.

The commander's instructions could be heard over the repeater:

"Standby for test mode! On course. On glide path. Altitude 100.

"Test mode."

G. Syusyukalov gives the command to turn on the instrumentation. The navigator precisely reports the distance to the ground--8, 6, 3, 2, 1, 0. The spoilers are deployed.

Reverse thrust is not used on these flights. We are waiting for problems from the brakes and reverse thrust will be held in reserve for use if needed. We begin braking immediately after touchdown. We are also testing the aircraft's behavior when the leading- or trailing-edge flaps are not deployed. In this case we use reverse thrust from all four engines and the brakes in order to stay within the recommended runway length.

Now we are landing on three engines and testing the aircraft's behavior in this situation.

The aircraft tries to leave the runway, to loop around, but the test pilots hold it on the centerline. Reverse thrust is engaged on the two inboard engines. Our speed drops. The brakes are applied. The aircraft dips and slows but holds tightly to the broken white line along the center of the runway. We taxi to the parking area.

A fuel truck approaches. Now we are taking on about 20 tons of fuel to simulate conditions under maximum landing weight. The testing continues.

The crew is in place. We have clearance to start engines. The IL-76 again goes to the end of the runway to begin its climb into the skies near Moscow. Again the commander's voice is heard:

"Test mode."

The recorder strips again begin to register curves which will be given to technicians for analysis on the ground. Judging from this data, according to Mikhail Stepanovich Kuznetsov, everything seems to be in order and the tests are successful.

This day we were to conduct the entire testing program on a dry runway. There remain only two flights with a wet runway and the program will be finished.

While we were on the taxiway streams of rain began to hit the cabin windshield. Within a few minutes there was not a dry spot on the runway or taxiway.

"The weather is correcting our experiment plan," says Viktor Gerasimov. "Maybe," the commander agrees, "we could finish all the testing today."

We received the "OK" for two more flights with a wet runway. The whole process was repeated: takeoff, a flyaround, landing, "test mode", a rattling shift to reverse thrust from all engines and maximum wheel braking. The equipment in the cabin of our IL-76 continuously records the parameters required by the technicians.

The final landing. We taxi to the parking area and shut down the engines of our much seen aircraft. I did not write the words "much seen" by accident -- that is a fact. The IL-76 with registration number 76502 was the first in the field for service. It underwent testing in Tyumen. With it, M. Kuznetsov carried multi-ton dump trucks, excavators and other equipment urgently needed by petroleum engineers in Nadym, Surgut, Nizhnevartovsk and Yagelnoye, combining this work with the transportation of the first four instruction teams.

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INTERNATIONAL PROJECTS, OTHER WORK OF 'AEROPROYEKT' INSTITUTE

Moscow VOZDUSHNYY TRANSPORT in Russian 29 Sep 84 p 3

[Article by V. Berezin, department chief in the "Aeroproyket" State Planning and Surveying and Scientific Research Institute for Civil Aviation: "Lines of Friendship: Mutually Beneficial Relations Strengthen"]

[Text-- Moscow--Airline passengers traveling to "Freedom Island" have seen how the reconstruction of Jose Marti International Airport is progressing. Work on the project, designed by Yu. Ustinov, G. Smirnov and V. Demkin, V. Polyakov and Chief Project Engineer V. Novikov of the "Aeroproyekt" State Planning and Surveying and Scientific Research Institute for Civil Aviation, is being carried out by our Cuban friends.

Work on documentation from the very beginning was conducted in close cooperation with Cuban engineers and architects. The creative teaming of specialists from brother countries has enabled the choice of the best possible solutions. In the process, Cuba's special conditions were considered: high humidity, hot sun and frequent hurricanes.

Specialists from our institute also completed the terminal project for Ulan-Bator, the capital of the Mongolian People's Republic. The project team included G. Smirnov, chief project engineer, S. Funtikov, chief designer, and others. A Soviet construction organization built the terminal itself. The building is a single unit with two tiers of windows rising on first floor columns. Its volume/space composition and elements of internal and external finishing reflect the national traditions of Mongolian architecture.

Our institute renders technical assistance to other socialist and developing nations. Specialists are conducting work to deepen and further the association of CEMA-member countries and to develop socialist integration through long-term, multilateral and bilateral cooperation programs.

Cooperation with socialist countries is primarily directed toward the implementation of the General Agreement on Cooperation in the Development of International Airports, signed on 26 July 1978 by delegates from the governments of Bulgaria, Vietnam, Hungary, the German Democratic Republic, Cuba, Mongolia, Poland, the USSR and Czechoslovakia.

The long-term targeted program of cooperation for the development of transportation relations between CEMA-member nations envisions the development of technical resources for passenger information systems, baggage handling and mechanized prefabricated warehouses. This includes such devices as scales with built-in dispatcher consoles and electric baggage-handling carts for various conditions. Highly efficient equipment is being developed for airport fueling facilities and for airport maintenance.

At this time resource nomenclature is defined, technical specifications for each of these resources are established and CEMA-member nation needs for such equipment have been determined.

We must note the successful cooperation between Soviet and Czech specialists in the development of a device to evaluate runway surface braking conditions. Tests have been carried out with two models in the USSR and in Czechoslovakia. These have shown the units to be in accordance with technical requirements. It has been established that the unit operates normally. The question of mass production will be taken up after final work is completed and the device is accepted.

"Aeroproyekt" specialists participated in the development of a scientific/technical cooperation program between the Ministry of Civil Aviation the German Democratic Republic's Ministry of Transport on the problem of "Development and application of devices for ground servicing of aircraft." Fulfillment of the measures envisioned in the program will result in a 70-80 percent level of mechanization in loading/unloading operations, a 1.4-fold increase in productivity and a 40-60 percent reduction in loading/unloading times.

Scientific/technical cooperation is also underway with Canadian airport construction specialists on problems involved in increasing aircraft safety and operational availability. In view of Canada's high level of practical experience in airport and airfield design, a line of scientific experiments has been defined for implementation by specialists of the two countries.

As a result of mutual research using technical solutions from Canadian airports, it is proposed that initial requirements be developed for experimental modeling of a system to warn of ice formation, equipment to evaluate pavement uniformity and a modified mobile air terminal.

Also in progress is long-term scientific/technical cooperation with French specialists in the area of designing construction measures, equipment and operational techniques for airports. In this, examinations are made of important tasks involved in supplying airports with modern, highly efficient equipment, the development of standards and the conducting of joint research. These personnel are touching on problems such as paving, improving passenger

processing and baggage handling technology, equipping airports with facilities for aircraft fueling, technical servicing and food service supply as well as airport maintenance.

One result of cooperation is the joint preparation of ICAO recommendations on fuel facility distribution, the development of a new generation of devices for measuring runway traction coefficient values and other questions.

"Aeroproyekt" specialists are devoting all their knowledge and efforts to furthering the scope and degree of scientific/technical cooperation with foreign countries in the field of civil aviation. At the same time they are working toward strengthening mutually beneficial relations and an atmosphere of trust and peace.

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DETONATION COATING LAB AT BYKOVO CA PLANT NO 402

Moscow VOZDUSHNYY TRANSPORT in Russian 16 Oct 84 p 3

[Article by VOZDUSHNYY TRANSPORT correspondent A. Vovk: "Spray Coating Method"]

[Text] Among the shops of Bykovo Civil Aviation Repair Plant No. 402 is a small, two-story building housing the detonation coating lab. This unusual laboratory is headed by Candidate of Technical Sciences V. Aulov.

The building is quiet. Opening one of the unmarked doors in the first floor hallway we are met by the sound of cannon fire. The process of placing coatings on components by means of detonation takes place at a high noise level--up to 150 dB. This is the reason a special hall and chambers with high sound insulation levels were required.

"Our laboratory started in 1981," stated V. Aulov. "The first component we worked on restoring was the IL-76T landing gear axle. It's an expensive part, more than 3,000 rubles were literally thrown away due to a slight amount of wear. Rapid analyses were carried out in the laboratory, allowing the development of a restoration process. This was only the beginning. Among the components we now restore are many costly items like D-30 engine compressor blades, IL-76T hydraulic cylinders and other assemblies and parts. For 1983, the economic effect of our work was some 605,000 rubles. In 1984 this amount will be even greater."

Experience shows that the Bykovo Aviation Repair Facility experiment to develop a laboratory was successful. Of course, they have their difficulties --a lack of equipment to carry out rapid analyses and a shortage of personnel. As a whole, however, the direction of their work is very promising and, according to management, this work must be supported and further developed. This is well understood by the management of the Aviaremont Association and the Ministry. Suffice it to say that an interdepartmental program of specific work on the restoration of components has been approved by the Ministry of Civil Aviation through 1990. The economic effect of recycled parts during this period should amount to several tens of millions of rubles in the field.

So, our time at the plant laboratory ended. At the threshold of the building, this time we were met not with quiet but with the powerful sound of an IL-76T on takeoff. Who knows, perhaps it too has assemblies and components restored within these walls.

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CIVIL AVIATION

DESIGNER ON CIVIL AIRCRAFT DESIGN TRENDS IN USSR

Moscow NEDELYA in Russian No 33, 13-19 Aug 84 pp 12-13

[Article by S. Yeger, Hero of Socialist Labor, professor, doctor of technical sciences and Lenin and State Prize Laureate; "A designer's opinion: Where is the airplane going?"; passages enclosed in slantlines printed in boldface]

> [Text] First, we should agree: we are discussing civil aviation alone. By this we mean the aircraft that have made our lives more dynamic, reduced distances, brought cities closer together, helped to develop tourism and allowed us to feel that our planet is not as large as we earlier believed.
>
> So, where is the airplane "flying"? What will it be like in the coming decades? What forces will shape its future form? Who and what will most influence it?

The questions are before us. We shall seek the answers. Particularly because the answers are not far away, they are, so to speak, on the surface. Although, strange as it may seem, they are not linked to pure aviation problems and do not relate, for example, to the laws of aerodynamics upon which aircraft are designed. The answers involve purely economic criteria such as product price and value. To be more specific one must say /the so called "energy crisis" expressed specifically in terms of increased petroleum and aviation fuel costs, is the primary, definitive influence in the development of modern civil aviation./

How does all this relate to aircraft design?

Directly: The main problem facing aircraft designers at this time is the need to reduce fuel consumption as much as possible. The number of kilometers an aircraft can carry a passenger on one kilogram of fuel has become the prime indicator of aircraft efficiency (this can also be expressed in terms of the number of grams of fuel a given aircraft requires to carry one [or 100] passengers a distance of one kilometer).

What are the approaches to reducing aircraft "appetite"? All of these can be expressed in terms of three aspects: /design, production and operation./

The first approach assumes the development of aircraft with lower fuel consumption rates. Such a reduction can be achieved by installing more economical engines, increasing the aerodynamic efficiency of the airplane as a whole, reducing aircraft empty weight, or by the application of all three measures in combination.

It is fully possible to reduce engine "appetite" but this involves a significant increase in engine diameter and, consequently, increased weight and aerodynamic drag. Further, this leads to the need to increase turbine gas temperature. This in turn requires new materials for turbine blades and complicates turbine construction. All this, I repeat, is feasible and these "economical" engines are being produced around the world.

But, as I understand, any aviation "expert" will recall that turboprop engines, such as those installed in the Tu-114, Il-18 and An-10 aircraft, had specific fuel consumption rates one half those of modern two-stage jet engines. With this in mind, one asks: why isn't there a return to the turboprop engine, in spite of its high noise and vibration levels and operational complexity?

I believe that the venerable turboprop will not be included even in the aircraft of the near future.

A direct return is not possible. The dialectics of development predetermines a rise to a higher level ("spiral" development) rather than the possibility of a return to the "old." Here, this means that new or improved aircraft may include new, improved turboprop engines with multi-blade propellers, similar to fans, instead of traditional propellers with two, three or four blades. The picture shows an aircraft with this new type of propeller.

Another area in the design of passenger aircraft for the near future involves the reduction of empty aircraft weight. What would be achieved by reducing aircraft weight (I am referring to its design and equipment weight) by as little as one kilogram? For the typical jet passenger plane such a reduction in weight would reduce fuel consumption by 64 grams over a 1 hour period. If we assume 500 such aircraft flying 2500 hours per year each, this results in a savings of some 80 tons of fuel!

If in reducing empty aircraft weight by one kilogram over the flight distance we could take a further 250 grams of fuel from the aircraft, we would be dealing with a 100 ton savings. This is a considerable figure. Moveover, all this is achieved by reducing aircraft weight by a "mere" kilogram!

We also note that research carried out in this country and abroad indicates that a 10-15 percent improvement in aircraft aerodynamics can be achieved through new, aerodynamic wing profiles, increased wingspan and a number of other improvements.

Thus, as you can see, aircraft design measures /can cut fuel consumption by roughly a third within the foreseeable future./

/The second approach/ to the search for higher economic indicators proposes improvements in the mass production of passenger aircraft, especially as concerns their external shape. Wing, fuselage, empennage and engine nacelle coverings are now made of individual Duralumin sheets. Any errors in forming the seams of these sheets during production will increase aerodynamic drag, thereby increasing fuel consumption. Operational experience with the US Boeing 737 (an aircraft in the same class as our Tu-134) indicates that if one skin plate overlaps another by 2.5 millimeters along a seam only 3 millimeters in length, there will be a 3-4.5 kg/hr increase in fuel consumption. Thus, for 500 such aircraft the excess consumption would be 4000-5000 tons per year!

Other sources of similiar "production technology" losses include unreliable passenger cabin sealing and paint finish irregularities (irregularities in a 0.9 square meter area of the leading edge of a Boeing 737 wing can lead to excess fuel consumption on the order of 18 tons per year).

Finally, /the third approach/ involves aircraft operation. I have already discussed the effects of excess weight. An aircraft is filled with tens of tons of fuel prior to takeoff. If this amount is more than needed for a given flight, there will be excessive fuel consumption. This also occurs when flights involve less than optimal altitudes (11-12 km), when the aircraft has uncalibrated instruments and when the shortest flight path is not taken.

However, the development of air transport involves more than economic problems. Increasing concern is being devoted to ecological aspects. The effort to extend service to an increasing number of populated areas requires the construction of large airports, and a modern airport with its 2.5-3.5 kilometer runway lengths means hundreds of hectares taken out of agricultural production!

Thus, there is a requirement for aircraft which can operate from smaller runways. The current level of development will allow production of short takeoff and landing (STOL) aircraft within the next 5-10 years. These aircraft will be capable of operating from runways only 500-800 meters in length and will take off and land at sharper angles. Thus, airfield size

could be reduced. However, this gives rise to a conflict: STOL aircraft must have more powerful engines and more complicated wing structures (leading and trailing edge flaps, etc.). All this is extra weight and increases fuel consumption. From this point of view, short takeoff and landing aircraft are more a thing for the future.

How do I see our aircraft in the 1990s?

I believe long-range routes will be flown by aircraft similar to the Il-86. Medium-haul routes should see the appearance of aircraft capable of handling 180-200 passengers, with more economical engines, longer wingspans and slightly wider fuselages. Apparently such aircraft will make up the bulk of the aviation fleet.

The short-haul situation is more difficult to foresee. Here, aircraft will compete with automobiles and bus transportation. Obviously, short-range aircraft will have new-generation turboprop or turbofan engines.

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IMPROVED SPRAYER FOR AN-2 CROPDUSTING WORK

Moscow VOZDUSHNYY TRANSPORT in Russian 25 Sep 84 p 2

[Article by A. Sobachkina, senior engineer, Krasnodar Branch of the State Scientific Research Institute for Civil Aviation: "Advantages of the new model"]

[Text] From the standpoint of its external details there was nothing to distinguish this flight from the others. As before, it called for spraying granulated nitrogen fertilizer on a rice crop in the shortest time possible, with the greatest possible productivity and highest possible quality. The mission was to be carried out by an An-2 aircraft fitted with a wide-band ducted sprayer. This time, however, a modified RTSh-1B version was fitted instead of the RTSh-1.

Judging from the lively conversation among the test participants, the design group for the improved unit had succeeded in fixing a number of problems which had plagued the old model. In any case, within a few minutes after the An-2 took off it was apparent to those present that (in contrast to the situation with the heavy RTSh-1) the aircraft did not need a new engine in order to work with the modified sprayer. The new model could be carried successfully even by an engine with a considerable number of hours in service.

The modification's advantages include the ability to operate from dirt and snow-covered airfields since its lowest components are mounted at least 430 mm above the ground.

The sprayer presented by personnel from the Krasnodar Branch of the State Scientific Research Institute for Civil Aviation and a Kiev plant has other valuable features. In a 40 meter wide fertilizer application band it assures uniform distribution (with a variation rate of 20-25 percent) and has a lower drag coefficient than its predecessor. This allows a savings of up to 11 kilograms of fuel per flight hour on one aircraft alone.

The modified unit's quality was proven in multiple evaluation tests and preliminary experience testing under practical conditions. Guided by this goal, the managers of the "Kuban'" test farm, part of the Kuban Agricultural

Institute, invited the testing team to spray nitrogen fertilizer on rice fields on their land. Within a day the amount of fertilized land was increased by 400 hectares.

Small-scale production of the improved model (20 units) will be in progress by the end of 1984. At that time fuel consumption savings per flight hour will be expressed in terms of hundreds and thousands of liters rather than dozens.

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'AEROPROYEKT' DEVELOPS IMPROVED RUNWAY SURFACING

Moscow VOZDUSHNYY TRANSPORT in Russian 25 Sep 84 p 3

[Article by A. Vinogradov, chief of an "Aeroproyekt" department, candidate of technical sciences: "Scientific and Production Forces Combine for Long Runway Life"]

[Text] Moscow--I want to discuss a problem which seems trivial in comparison to those involved in the design of new aircraft or helicopters but whose solution is critical to the overall development of aviation. This is the problem of developing reliable and long-lasting airfield surface pavements. Every runway is a structure designed to allow aircraft to build up the speed required during takeoff and to reduce speed during the landing run. The runway pavement must accept the aircraft's entire weight, as a moving object, during landing. The higher the speed the greater the aircraft's mass and the greater its effect on the pavement.

Observant persons might have noted that deep ruts are sometimes formed on street surfaces near trolley and bus stops. These occur due to insufficient pavement resistance at points experiencing intensive braking forces.

During each landing a runway surface undergoes forces 10 times those experienced in such braking since the aircraft's weight and speed are many times greater than those of a surface transportation vehicle. A surface covering must be relatively thick in order to assure adequate strength and reliability. In the case of modern, heavy aircraft this thickness can reach 50-60 cm of concrete poured over a reinforced base. Until recently, concrete of this thickness had to be placed in two passes since there were no machines powerful enough to compact a concrete mixture of the required thickness.

The theory of durability states that we lose a considerable amount of strength when we divide a pavement into two layers. Greater layer thicknesses must be used to compensate for this loss and consequently the loss is manifested in terms of material. For example, a single layer thickness of 50 cm is equal to a dual layer thickness of 58 cm. Thus, our

material loss amounts to 8 cm or, in monetary terms, 4-5 rubles per square meter of pavement. Considering the size of an airfield, this loss becomes staggering.

All this does not lend itself to a simple, definite solution. It seems that after the vehicle passes, a great thickness of fresh concrete creeps just as the familiar child's mud pie after the mold is removed. Thus, the edges of the concrete become uneven. Furthermore, this defect (edge creep) makes it impossible to form so-called butt-joints which play an exceptionally important role in airport pavements.

The solution to this problem was found by us at the department after a great deal of research. A number of various single-layer pavement configurations with all types of possible joints were proposed but for various reasons all of them proved to be unsuited to practical implementation. Finally, success was achieved. The author and Doctor of Technical Sciences O. Totskiy proposed the so-called framed pavement design.

In this method, prior to concreting, I-beams are placed on the prepared surface so that, after welding, they form frames. These beams are similar to those used for the porches of rural homes, except that they are substantially larger. One frame cell covers an area of some 50 square meters. After concreting, each cell forms a finished plate framed by the metal form, similar to a windowpane in its frame.

Why the frame? It fulfills two functional roles. During concreting it acts as a form and prevents edge creep. Later, as the concrete hardens, the frame becomes an excellent joint component.

However it was just an idea requiring testing. At that point work began in earnest. Its backers -- chiefly department members O. Totskiy, I. Isayev, I. Poryvayeva, O. Taruntayeva, B. Savenok, and A. Skobelev--worked hard in the laboratory, the "Aeroproyekt" computer center and at the test construction sites. The work proceeded with dispatch. The first experiments were conducted in 1981 and the new pavement has already been accepted for operational use at one airport by an authoritative interdepartmental committee of the Ministry of Civil Aviation and the Ministry of Transport Construction. At the present time final work is underway, including the preparation of documentation for distribution to specialists in order for framed pavement design and construction to be disseminated everywhere.

Thus, one problem has been solved. As the reader understands, this solution is suitable for new runway pavements, but what about resurfacing?

The volume of resurfacing work is increasing yearly. There are many unsolved problems in this area. One idea in particular has attracted our attention. In this idea, after resurfacing, the pavement is suitable for use regardless of weather conditions.

Our department has begun work on such a design, an all-weather pavement. All in all a very exciting problem....

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BRIEFS

TU-154 ON NAMANGAN-MOSCOW ROUTE--This was probably the first time that so many people had gathered at the Namangan airport: they were waiting for the arrival of a large airliner. Those who were taking part in renovation of the airport complex also had come here. "The latest radar equipment has been installed. All engineering and technical personnel received additional training at different training centers in the country long before today's event," says D. Isametdinov, deputy commander for political education work at the Namangan Aviation Enterprise. And here the Tu-154 is at the Namangan airport. For now this is a proving flight, which also brought passengers from Tashkent along with members of the State Commission. Soon a scheduled air route will be opened between Namangan and Moscow, and the Tu-153 will be flying into Namangan from Tashkent continually. Next year it is planned to open one more air route--from Namangan to Leningrad. [By PRAVDA VOSTOKA correspondent V. Vorokhov] [Excerpts] [Tashkent PRAVDA VOSTOKA in Russian 14 Sep 84 p 4] 8936

NAMANGAN AIR SERVICE EXPANSION--Namangan--A modern, convenient air terminal was built in Namangan in the last five-year plan, and now renovation of the runway has been completed. Now the airport will be able to accommodate Tu-154 aircraft. The first proving flight from Tashkent was made by a crew consisting of G. Sheverdyayev, check pilot of the administration's pilot-navigator department; F. Ka[illegible]ov, deputy commander of the flight subunit of the Tashkent Aviation Enterprise; copilot A. Arbuzov; navigator Kh. Il'yasov; and flight engineer I. Karavayev. Until now Yak-40 and An-24 aircraft have been flying into Namangan; they could be flown only to Tashkent, Samarkand, Dushanbe and Frunze. Now there is an opportunity to extend the radius of flights from the oblast center, to more fully meet the demand of residents of the rapidly developing oblast for air transportation, and to improve the quality of air service. A direct air link with Moscow will be opened in October, and soon Tu-154 aircraft will link the ancient city with the country's large industrial centers and resort cities. [By VOZDUSHNYY TRANSPORT correspondent A. LARENOK[[Text] [Moscow VOZDUSHNYY TRANSPORT in Russian 18 Oct 84 p 1] 8936

TU-134 SERVICE TO YOSHKAR-OLA--Yoshkar-Ola--Residents of Yoshkar-Ola, capital of the Mari ASSR, received a good present to mark the 300th anniversary of their city: a Tu-134 landed at the local airport. The proving flight which it made on the Kuybyshev-Yoshkar-Ola round trip was the beginning of continuous operation by this aircraft on airways linking the ASSR's capital with our country's largest industrial and cultural centers. This important event was preceded by intensive training of all services and sections of the local aviation enterprise. Construction workers of the Marstroytrest worked well, completing

renovation and extension of the runway and construction of facilities for modern ground equipment. The collective of the ERTOS [radio technical equipment and communications operation] base headed by G. Shmarov accomplished a great deal of work. In a short period of time, communications technicians were able to install new landing navigation systems and to equip takeoff control points with modern radar facilities which make it possible to handle aircraft of this type. [By VOZDUSHNYY TRANSPORT stringer V. Skrebkov] [Text] [Moscow VOZDUSHNYY TRANSPORT in Russian 18 Oct 84 p 3] 8936

AN-28 MANUFACTURED IN POLAND--Warsaw, 22 Oct (TASS)--An important event has taken place at the aircraft plant in the Polish city of Mielec: its collective began series production of the An-28 aircraft under Soviet license. The new aircraft, which has superior operational features which enable it to be used under instrument weather conditions, has been called upon to replace An-2 aircraft on local air routes soon. "Our contacts with Soviet colleagues are being expanded and enriched continuously," T. (Rychay), general manager of the enterprise, told a TASS correspondent. "The recently signed Soviet-Polish agreement on further collaboration in the field of aircraft manufacturing, in which the Mielec plant is assigned an important role on the Polish side, attests to this. We are delivering civil aircraft, including those for agricultural use, and a number of components for the Il-86 airliner to the Soviet Union. Mastery of their production has led to modernization and expansion of the enterprise's capacities, establishment of new work places, and to the planning of output and planning and design operations on a firm long-term basis." The product turned out by Mielec aircraft manufacturing workers is well known in other CEMA countries as well. [Text] [Moscow VOZDUSHNYY TRANSPORT in Russian 25 Oct 84 p 4] 8936

AKSUAT AIRPORT BEGINS SERVICE--(TASS)--The first aircraft landed today at the new airport built in the rayon center of Aksuat in Semipalatinsk Oblast. The airport has been provided with modern navigation equipment. Development of a network of air service is being carried out in the oblast under the program to socially and economically transform remote livestock raising rayons. [Text] [Moscow VOZDUSHNYY TRANSPORT in Russian 3 Nov 84 p 4] 8936

MOSCOW-ERFURT AIR LINK--Sheremet'yevo--Scheduled flights by Aeroflot aircraft were begun 4 November on a new airway linking Moscow and Erfurt, a large industrial city in the GDR. This is the fourth point in the GDR, following Berlin, Dresden and Leipzig, to have scheduled air service from Moscow. The closest ties, based on friendship and fraternal collaboration, link the aviators of Aeroflot and Interflug. One aspect of this collaboration is the continuing expansion of the network of air service. Today Berlin is linked by direct flights with Moscow, Leningrad, Kiev, Minsk, Tashkent and Tbilisi; Leipzig is linked with Moscow and Kiev; and Dresden is linked with Moscow, Leningrad, Tbilisi and Kiev. The first flight on the new airway was made by a Tu-134 headed by engineering pilot M. Boldyrev. It is interesting that the commander is the grandson of the famous pilot and one of the first Heroes of the Soviet Union, M. Vodop'yanov. [By VOZDUSHNYY TRANSPORT stringer V. Degtev] [Excerpts] [Moscow VOZDUSHNYY TRANSPORT in Russian 13 Nov 84 p 4] 8936

FINNISH MINISTER'S VISIT--USSR Minister of Civil Aviation B. P. Bugayev received Finnish Minister of Communications M. Puhakka, who is visiting the Soviet Union, on 19 November. During their conversation, questions of further development of Soviet-Finnish collaboration in the field of air service were discussed. [Text] [Moscow VOZDUSHNYY TRANSPORT in Russian 20 Nov 84 p 1] 8936

YAK-42 FLIGHTS FROM SARATOV--Saratov--A Yak-42 aircraft, developed in the Twice Hero of the Soviet Union A. S. Yakovlev Design Bureau, has begun flights from Saratov to Moscow. Instead of two and a half hours, the flight will take an hour and 15 minutes. "We are ready for operation of the new airliner," V. Kudan, shift chief of the airport's engineering operations service, told a GUDOK correspondent. "Incidentally, the Saratov Aircraft Plant has successfully mastered production of these aircraft. And in the near future pilots in our flight detachment will be making nonstop flights in the new aircraft to Leningrad, Sochi, Mineral'nyye Vody and other cities in the country." [By. S. Kasatyy] [Text] [Moscow GUDOK in Russian 21 Nov 84 p 4] 8936

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USSR PLANS FUTURE PURCHASES OF CSSR-BUILT MOTORCYCLES

Moscow ZA RULEM in Russian No 10, Oct 84 p 9

[Article by Yan Buzek, chief of the Motokov section in Moscow: "Seminar in Chertanov"]

[Text] Animation reigned in the technical center of the CSSR Trade Delegation in Moscow. The center's modern buildings, spread out in Chertanov, had guests--representatives of Avtoeksport, the USSR Ministry of Trade, the VNII [All-Union Scientific Research Institute] of Motorcycle Building, the motorcycle sections of trade bases, editors of the magazine ZA RULEM, and other participants in a large seminar on the topic of "Czechoslovakian motorcycles for the USSR in the 12th Five-Year Plan". It was conducted by the CSSR's Motokov external trade association, the YAVA [expansion unknown], ChZ [expansion unknown], and Veloreks plants, and CSSR Trade Delegation.

Motorcycles of the YAVA, CHZ (and at one time Manet and Ogar as well), and ESO brands and the Veloreks sidecar have been supplied to the USSR since 1946. Since 1957 they have begun to be received in the Soviet Union in ever growing numbers, and now Soviet motorcyclists receive more than two million Czechoslovakian-made vehicles, sport models as well as road models. It is for this reason that the seminar participants' interest in the assortment of models, their design features, and prospects for export from the CSSR in coming years was so great.

Plant specialists presented modernized and new samples of technology and exchanged opinions with consumers on service and repair of the YAVA and the Veloreks sidecars received by Soviet motorcyclists.

Side by side with familiar models, one could see many new ones there. The YAVA plant presented one of these. Almost 99 percent of its output is for export, primarily to socialist countries, and among them the Soviet Union is the largest buyer.

YAVA specialists presented a new two-cylinder two-stroke engine for the 350 cubic centimeter class of road motorcycles. Unlike the previous model, the cylinders are not iron, but aluminum with press-fitted sleeves of alloy cast iron, and the crankshaft and clutch are of a new design. The external styling of the engine has changed, in particular the side covers of the crankcase. And most importantly, its indicators have been improved. It has become more powerful (26 horse-power/

19 kilowatts at 5500 revolutions/minute) and more economical (4.2 liters/100 kilometers). It should be noted that at a compression ratio of 10.2 the engine operates on gasoline with a relatively low octane rating--90. The mixture of gas and oil is in a ratio of 40 to 1.

An important innovation is a 12-volt, more reliable electrical equipment system with a powerful (210 watts) alternator, a 5 ampere-hour battery, and completely new taillights.

This engine has been in lot production since the second half of this year. The YAVA street motorcycles are furnished with it, with a ChZ-472 front fork, and with a new front wheel and 180 millimeter brake drum. Their undercarriage and external styling remain the same for the time being. This transitional model has been given the index YAVA-638-5-00. In 1985 production will be established of the YAVA-638-0-00 motorcycle with new external styling, in particular with a different looking 17-liter gas tank, new taillight, changed side panels and other parts. Its basic data: mass, with equipment--170 kilograms; top speed--120 kilometers per hour with the driver sitting upright; base--1335 millimeters; saddle height--810 millimeters; tire dimensions: 3.25--18 in front and 3.50--18 in back.

The YAVA plant also demonstrated a road motorcycle with an experimental two-stroke water cooled engine in the 400 cubic centimeter class.

The Babetta-210 moped was demonstrated at the exhibition. It has a horizontal two-stroke engine with a working volume of 49 cubic centimeters and a capacity of 2.4 horse-power/1.75 kilowatts at 5000 revolutions per minute. An original feature is the two-speed gear box with automatic shift. Equipped, the Babetta-210 weighs 55 kilograms. Its top speed is 40 kilometers per hour and the planned fuel consumption is 1.8 liters/100 kilometers.

Still another supplier of motorcycle technology from the CSSR, the ChZ plant, showed the improved street model ChZ-472.6 with two-stroke two-cylinder engine in the 350 cubic centimeter class. It also has a 12-volt electrical equipment system. Production is set for 1985.

The Veloreks sidecars for YAVA motorcycles have been popular in the USSR for a long time. This plant exhibited the familiar Veloreks-562/03 model, equipped with an additional baggage compartment and a removeable hood, in Chertanov. In addition it displayed an experimental model of sidecar that is distinguished by increased comfort and safety in riding. It is supposed to be in lot production in the next five-year plan.

The symposium and exhibit gave specialists from the two fraternal countries useful information which will serve to strengthen their commercial and economic ties in this area.

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HISTORY OF KREMENCHUG MOTOR VEHICLE WORKS

Moscow AVTOMOBIL'NAYA PROMYSHLENNOST' in Russian No 8, Aug 84 pp 29-30

[Article: "From the History of Soviet Motor Vehicle Building"]

[Text] In April 1958 in the Ukrainian city of Kremenchug, on the site of a combine plant, production of a truck with a large load-carrying capacity was set up. From the Yaroslavl Motor Vehicle Plant the plant being reconstructed inherited the production of the three-axle YaAZ [Yaroslavskiy Motor Vehicle Plant] truck, which by that time had already proven itself in operation.

Organization of new production at the new plant was tied to the solution of such complicated problems as the fundamental reconstruction of functional production, assimilating new technological processes, and supplying the plant with qualified cadres. And these problems were successfully solved. By the end of 1959 the motor vehicle plant had already organized production of the KrAZ-222 dump truck with a load-carrying capacity of 10 tons, the KrAZ-214 with increased cross-country capability, and the general purpose KrAZ-219 with a load-carrying capacity of 12 tons.

Specialists from the Yaroslavl, Minsk, and Gorky motor vehicle plants gave much help to the new plant in assimilating and organizing production of the first vehicles.

From the very beginning of the vehicle plant's existence the collective's special approach to the equipment being developed was evident; it should have a large load-carrying capacity and be capable of working under the most various operating conditions. So the KrAZ-222 dump truck was intended for transporting dry and semi-liquid freight and had a bucket-type body that tipped backward at a 60° angle. It proved itself in operation on construction sites and in the mining industry, under roadless conditions and on improved roads. The KrAZ-214, with all-wheel drive, could transport various loads and tow trailers under the most difficult road conditions. The high dynamic qualities, towing gear, and air boosters on the trailer brakes allowed the vehicle to tow a trailer with a total mass of 10 tons on dirt roads and under roadless conditions, and one of up to 50 tons on highway. A winch was installed on it with a pull of up to 12 kilonewtons on the cable. The KrAZ-219 vehicle was universal; it could tow a trailer with a total mass of 15 tons and transport long loads (pipes, beams, etc.). Various equipment could be installed on the chassis (truck cranes, concrete mixers, compressors, drilling rigs, etc.).

The red challenge banner of the Kremenchug gorkom of the Ukrainian CP was presented to the Kremenchug Motor Vehicle Plant collective for fulfilling government plans for organizing production of the first large carrying capacity trucks ahead of schedule.

In 1960 the plant ceased combine production and switched over completely to truck production. The plant's collective had not only to organize production of new vehicle models, but continually to increase the reliability and longevity of those in production and to decrease their cost. The complexity of solving these problems lay in the fact that in 1960 it was necessary to organize production of more than 1000 parts and assemblies that the Yaroslavl Motor Vehicle Plant had ceased supplying, and in 1961 to increase truck production two-fold.

The enterprise's specialists worked persistently on perfecting technology and introduced into production everything new that had appeared in the field of motor vehicle building. And the results showed up without delay. In 1960-1961 the plant collective organized production of the KrAZ-221 truck tractor for towing a trailer with a total mass of 30 tons, the KrAZ-256 dump truck, the KrAZ-257 vehicle with a vehicle-borne platform, and the KrAZ-258 tractor. It was then that the first lots of the KrAZ-221 vehicle were manufactured in "tropicalized" and export models, and by the 43rd anniversary of the Great October 2 prototype KrAZ-214 dump trucks were produced, with a body that tipped to both sides.

All of the new models of KrAZ vehicles differed from their predecessors in increased reliability and fuel economy. For example, the KrAZ-256 dump truck had a smaller (by 0.5 ton) mass and a speed that was increased to 68 kilometers per hour, and it expended 100 liters of fuel per 1000 kilometers less than did the KrAZ-222. The designers introduced a number of substantial changes in it: they strengthened the rear suspension, developed a new transfer gear-box, etc. New technological processes were adopted in the manufacture of parts and assemblies--finishing parts by the plastic deformation method, diamond burnishing, electrochemical machining, etc. In all during the period of 1961-1964 the plant workers improved more than 500 vehicle assemblies and parts and instituted more than 80 advanced technological processes. All this allowed the dynamic qualities of the vehicle to be improved and its reliability and longevity to be increased.

For developing the KrAZ-256 dump truck design the plant was awarded the Diploma, second degree, and the group of specialists was awarded USSR VDNKH [Exhibit of National Economic Achievements] medals. At the international fair in Plovdiv the model was awarded a gold medal.

The plant confidently increased its rate of operation, and in December 1968 the 100,000th vehicle came off its main assembly line.

The collective's strenuous labor on redesigning, assimilating, and producing vehicles with a large load-carrying capacity received a high appraisal from the party and the government: a large group of plant specialists was awarded USSR medals and orders, and Sergey Nikolayevich Zaychenko, a turner in the mechanical shop, received the rank of Hero of Socialist Labor. Foreman I.V. Bandurenko, plant director I.M. Prikhod'ko, steelmaker S.M. Chunin, and plant veteran rner M.M. Bondarenko were decorated with the Order of Lenin. In the same year, by order of the minister of the motor vehicle industry, the title "imeni 50 years of Soviet Ukraine" was conferred on the plant.

By directives of the 26th CPSU Congress on the five-year plan of national economic development, the further growth of production and first of all, thanks to increased efficiency, fundamental improvement in production quality were stipulated for 1971-1975. In connection with this the motor vehicle plant collective was assigned the task of increasing the life of KrAZ vehicles by 30-50 percent by the end of the five-year plan. It was successfully resolved, and its successful resolution in many ways facilitated a complex system of production quality control (KSUKP) that was drawn up at the plant. It is enough to say that, thanks to KSUKP, for the 1970-1980 period mean-time-between-failures, the basic indicator characterizing the quality of vehicles produced, was increased almost four-fold; the level of rate of basic production since the vehicle was first produced reached 98.5 percent; the life of the vehicle was increased more than two-fold against the planned increase; the production level of vehicles of the highest quality category was 73 percent, and of the first quality category--27 percent.

In recent years at the plant the production of a new family of vehicles, the KrAZ-250 and KrAZ-260, has been worked out and organized. (Note that the transfer to lot production of the new vehicles as well as the plant reconstruction required in connection with it have been accomplished without stopping basic production). They have the new all-metal cabs with a reliable heating system, increased capacity engines, and three drive axles. The model with a vehicle-borne platform has a load-carrying capacity of 20 tons, and the tractor's capacity is 35 tons, that is twice that of trucks of previous modifications. The specific metal content of the new models has been lowered significantly.

The KrAZ-260, in comparison with the KrAZ-255B1, has 20 percent greater load-carrying capacity, 45 percent longer life before the first overhaul, 11 percent higher maximum speed, and 6 percent lower planned fuel consumption. The KrAZ-260 has retained the traditional hood configuration, but in this the cab extends somewhat over the engine. This allowed the hood to be made shorter, visibility from the cab to be improved, and the freight platform to be lengthened. The KrAZ-260 is the plant's first model with an engine with gas-turbine supercharging. To make engine starting easier, the vehicle is equipped with a pre-starting heater and a "Termostart" device. In order to improve cross-country capability and to utilize optimally the power supply, a completely new transmission has been adopted which provides 16 forward and 4 reverse gears. The basic gear-box has been executed in a unit with a two-stage supplementary gear-box. The design of the transfer gear-box has also been changed; its features are that the drive to the forward axle does not disengage (all wheels are constantly drive wheels). Such a treatment for a vehicle of increased cross-country capability was not adopted accidentally; with continuous (non-disengaging) wheel drive the total resistance of the wheels' rolling motion, as well as fuel consumption, are the lowest. With this in view, a center differential has been installed in the transfer gear-box.

The Kremenchug Motor Vehicle Plant imeni 50 years of Soviet Ukraine is a relatively young enterprise; it recently celebrated its 25th year. But nevertheless this plant's brand has acquired a widespread reputation. KrAZ large load-carrying capacity vehicles are laboring on construction sites, at mines, and at power plant projects; they accomplish long freight hauls on the country's highway routes and operate in 40 foreign countries in Europe, Asia, Africa, and Latin

America. In this is the huge service of the entire plant workers' collective which, struggling to fulfill the resolutions of the 26th Party Congress and the February (1984) and April (1984) CPSU Central Committee plenums, made all Soviet people happy with new labor success; by May 1, 1984 they put out the 500,000th KrAZ.

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BRIEFS

NEW VOLGA BRIDGE--The opening of a new bridge across the Volga was celebrated at Rzhev. It was built by mandate of the electors. With the approach ramps, the bridge is almost a kilometer long, and is 18 meters wide, which permits four lanes of motor vehicle traffic. The bridge was erected on high banks and is suspended 30 meters above the river. The collective of Bridge Building Detachment 19 utlized advanced methods in erecting the span structure and in constructing the support footings. All the work was carried out by contract brigades, some of which worked shift operations. The bridge was put into operation ahead of schedule. First Secretary of the Kalinin CPSU Obkom, P. Leonov, congratulated the construction workers on their labor achievement in a speech at an obkom meeting. Since the beginning of the five-year plan, Bridge Building Detachment 19 has erected more than 100 bridges in the oblast. [Text] [Moscow STROITEL'NAYA GAZETA in Russian 17 Oct 84 p 3] 9006

NEW BRIDGE OVER UVOD'--Savino (Ivanovo Oblast). (TASS) Localities in the outskirts of Savinskiy Rayon have received reliable transport connections with the oblast center. Motor vehicle traffic has been opened in the town of Voznesen'ye on a 140-meter-long reinforced concrete bridge across the Uvod' River, a tributary of the Klyaz'ma. This construction project, initiated by electoral mandate, was taken under control by the office of the deputy, and the people's electors coordinated the operations of the subcontractors. Adopting shock-work methods in honor of the 67th Anniversary of the Great October Revolution, bridge builders E. Nazarov and Ya. Litvinets, bulldozer operator V. Vorob'yev, and excavator operator A. Vzyatkin regularly fulfilled one-and-a-half norms per shift. [Text] [Moscow, SEL'SKAYA ZHIZN' in Russian 6 Nov 84 p 1] 9006

NEW HIGHWAY IN DESERT--Ashkhabad--Through motor vehicle traffic has been opened along a 460-km asphalt route connecting the Turkmenistan oblast centers Chardzhou and Tashauz. The new main highway permits speeding up delivery of freight to the northern regions. Presently all oblast and rayon centers of Turkmenistan are connected with one another by means of asphalt-surface highways. [Text] [Moscow SEL'SKAYA ZHIZN' in Russian, 29 Nov 84 p 1] 9006

TROLLEY CONVEYER PROBLEM EXAMINED--The newspaper has spoken out. What has been done? The management of Minavtoprom [Ministry of the Automotive Industry] and the All-Union Industrial Association "Soyuzavtobusprom" have, with the assistance of the managers of the Engels plant imeni Uritskiy, examined the report by V. Lifanov published on 16 August under the headline, "Trolleybus--Bumps on the Conveyer". The criticism was judged to be correct. As A. Kobzev, deputy minister of the automotive industry, informed us, measures are being taken to eliminate the shortcomings noted in the newspaper article. Greater attention is being devoted to fulfilling the plan for organizational and engineering measures. Machine tools have been produced and introduced for bending the backrest of the seats, as well as a multi-spindle head and compression mold cast under pressure. Electrical steel-making furnaces have been installed and a universal attachment for feeding the pipe for cutting will be completed before the year's end. Two-shift operation has been introducted for machine tools with programmed control. G. Anfinogentov, secretary of the Saratov party obkom has informed the editors that the report was also discussed at a general party meeting at the enterprise. The chief engineer at the plant, V. Bal'zamov, has been singled out for poor control over fulfilling the plan for organizational and engineering measures. Chief specialists were subjected to sharp criticism for slow rates of fulfilling the plan for technical reequipment. [Text] [Moscow SOTSIALISTICHESKAYA INDUSTRIYA in Russian 25 Nov 84 p 2] 9006

ICE HIGHWAY ACROSS LENA--Yakutsk--Heavy tractor-trailer units have commenced moving across the frozen Lena a month earlier than usual. This permitted connecting the capital of Yakutiya with the Trans-Siberian RR by the winter route. At this time the thickness of the river ice ordinarily does not exceed 30-40 cm; whereas, the ice sheet should be several times thicker to permit passage of the heavily-loaded modern vehicles. Specialists from the "Yakutavtodor" [Yakutsk Motor Vehicle Highway] administration have, together with scientists, assimilated a new method for thickening the ice by means of artificial rain. A composite mechanized brigade, outfitted with special equipment, has been created for this purpose. [Text] [Moscow VODNYY TRANSPORT in Russian 8 Dec 84 p 4] 9006

NEW AUTO MODELS--Togliatti (TASS)--There is an addition to the large family of Zhigulis. The first vehicles of the new model VAZ-2104, an improved version of the Universal, have been assembled at the Volga vehicle plant. The spacious and practical Universal won wide popularity. The new version of the vehicle has a modern design and a more powerful engine. The Universal inherited a smartly finished interior and comfortable seats from the model VAZ-2105, on the basis of which it was designed. [Text] [Moscow IZVESTIYA in Russian 19 Sep 84 p 1] Moscow motor transport workers have received the first lot of Zhiguli electric cars. It is difficult to tell by the outward appearance that before us is the first VAZ [Volga Motor Vehicle Plant] where an electric motor has been installed in place of a gas engine. The Electro pick-up is intended for the transport of small loads of freight. Electrically powered vehicles are not a novelty on the streets of Moscow. The first experiment with ecologically sound transport was conducted at UAZ [Ulyanovsk Motor Vehicle Plant] and YerAZ [Yerevan Motor Vehicle Plant]. One of the Moscow truck fleets, the 34th Glavmostrans integrated works, became an operational testing ground for electric vehicles. Not long ago electric vehicles began serving as taxis. At Preobrazhenskiy Square rafiks, on either side of which appears the letter "E", have begun taking passengers. [By N. Poletatina] [Text] [Moscow IZVESTIYA in Russian 8 Oct 84 p 2] 12461

CONSTRUCTION ON AGURA--ADLER HIGHWAY--A large group of specialists and workers from the Yuzhdorstroy trust, Mostotrest, SoyuzdorNII [All-Union Scientific Research Institute of Roads and Highways] , Tbilgiproavtodortrans, and a number of other organizations has been awarded the 1984 USSR Council of Ministers Prize for the design and construction of a complex of engineering-transport structures on the Khost-Kudepsta sector of the Agura-Adler highway. The complex includes 2 overpasses with a total length of 1,767 meters and a span of 33-35 meters. Also constructed in the sector were four grade-crossing elimination structures on various levels, three underground pedestrian crossings, pedestrian bridges over the Khosta and Kudepsta rivers, and a flood drainage ditch. Local soil was used for the embankment. Approaches that allowed the natural and architectural features of the coastal resort zone to be preserved and land that was of little value and unprofitable for development to be used were stipulated in the design and brought about in practice. The carrying capacity of the road has grown fourfold. [Text] [Moscow EKONOMICHESKAYA GAZETA in Russian No 41, Oct 84 p 9] 12461

TRAILER QUALITY IMPROVED--The Stavropol trailer plant has begun lot production of a modernized agricultural trailer. The new dumptruck trailer is 100 kilograms lighter. Reliability and quality have been increased significantly in its design. And it is more convenient to operate--thanks to spring mechanisms the drivers can open and close the gate easily. The production of the new trailers has become more economical as well. [Text] [Alma-Ata AVTOMOBIL'NYY TRANSPORT KAZAKHSTANA in Russian No 10, Oct 84 p 2] [COPYRIGHT: "Avtomobil'nyy transport Kazakhstana", 1984] 12461

REFRIGERATED SEMI-TRAILERS--In a suburb of the capital of Azerbaijan construction has begun on buildings for a branch of the Baku specialized motor vehicle plant. The plant will put out products of a type that is new for the enterprise--refrigerated semi-trailers. In 1986 the plant will switch over completely to the assembly of 5000 refrigerators and isothermic vans of the new series. And at the end of this year they plan to be the first in the country to begin production of 11.5-ton capacity refrigerated semi-trailers for international shipments. [Text] [Alma-Ata AVTOMOBIL'NYY TRANSPORT KAZAKHSTANA in Russian No 10, Oct 84 p 2] [COPYRIGHT: "Avtomobil'nyy transport Kazakhstana", 1984] 12461

NEW MINIBUS--The first prototypes of the modernized Latviya minibus have been put out at the RAF [Riga Bus Works] Minibus Plant imeni 25th CPSU Congress. An essentially new suspension has been installed on the modernized RAF-22038 minibus that was developed specially for buses of this class. The technical-operational parameters of the engine, and of the vehicle in general, have been improved. It has become more powerful and more economical. The total kilometers logged before overhaul have been increased to 25,000. The braking, ventilation, and interior heating systems have been improved, as have other assemblies. The driver's work area is more comfortable, and the Latviya's exterior and interior finishing have been improved. [Text] [Alma-Ata AVTOMOBIL'NYY TRANSPORT KAZAKHSTANA in Russian No 10, Oct 84 p 2] [COPYRIGHT: "Avtomobil'nyy transport Kazakhstana", 1984] 12461

CSO: 1829/56

GENERAL DIRECTOR ON 'SOYUZTRANZIT' ACTIVITIES

Moscow GUDOK in Russian 15 Sep 84 p 4

[Interview with "Soyuztranzit" General Director A. Nazarov, by GUDOK correspondent B. Ryazantsev: "Soyuztranzit Authority"; date and place not given]

> [Text] Of course, the direct route is always better if it is convenient and reliable. This quality is especially valued in international trade when goods are moved over vast distances: from continent to continent and from hemisphere to hemisphere. Traders use virtually every means of transportation. Goods cross the ocean on ships, fly above the clouds, move on trucks and, of course, by rail. In this country the transportation requirements of foreign firms are handled by "Soyuztranzit", the All-Union Foreign Trade Association. GUDOK correspondent B. Ryazantsev met with Soyuztranzit General Director A. Nazarov. Here is his story:

Our organization has its fifth anniversary in January. It seems a short time, but we are approaching a small jubilee with definite successes. We have had help in this from previous experience in shipping within the USSR. "Soyuzvneshtransport" had been occupied with this since 1967. In general, this type of work was begun in the 1920s by Soviet transport workers.

The shortest routes from Europe to Japan, Afghanistan, Iran, the Far East, Near East, Middle East and Southeast Asia go across this country. Goods can be delivered from Europe to Japan, for example, much more quickly via the USSR, a route some 13,000 kilometers long. This is better than shipping via the Suez Canal and Indian Ocean--a distance of 23,000 kilometers. The route via the Atlantic, Panama Canal and Pacific is even longer at 27,000 kilometers. To this, one has to add the dangers of the Pacific Ocean--storms and typhoons.

Of course, our system does not exclude maritime shipping. On the contrary we actively employ both river and ocean shipping. This is done where there is no other way to go. This is especially true in the case of transshipping goods from Nakhodka and the East to Japanese ports, Manila, Hong Kong, various ports in the Far Eastern countries and Australia. Vessels with mixed delivery systems work in internal waters: on the Azov, Black and Baltic Seas, where express freight is interchanged with railroads. When a client requires especially rapid delivery Aeroflot is there to help.

The bulk of Soyuztranzit freight is carried by the main rail lines. The Trans-Siberian Container Service (TSKS) is especially popular among shippers. This type of service is attracting more and more adherents.

Two years ago we celebrated our own type of anniversary, one million foreign containers crossed the territory of the Soviet Union. Its owner was our permanent partner, the Japanese firm "Jeyro". The number of our clients is growing. All this shows Soyuztranzit's ability to compete well in the international marketplace.

To be sure, the advantage of shipping via Siberia did not immediately draw attention to the association's activities. It required prior advertising, organizational work and the search for businessmen interested in our transportation services. Now in Australia and many countries of Europe and Asia we rely on a network of foreign representatives. They maintain permanent contact with various firms and fill one-time orders. Over one hundred specialists work with us, ensuring that Soyuztranzit operates in a stable manner without disruptions and overlaps. The number of clients is becoming greater than with the MPS [Ministry of Railways] which accounts for almost half of the volume shipped. In the near future discussions will be held on our association's suggestions for the implementation of specialized container rolling stock which would have to move on a strict timetable.

Of course a great deal of effort is involved — it is a new venture. But railroad personnel, sailors and dockworkers have a great deal of experience in cooperating in the transshipment of goods at transportation nodal points. It is just this kind of practice that is suitable for the preparation of schedules for specific rolling stock. Let us say, the distance between two points in Europe and Japan should be covered in two weeks by such a train.

Test runs which confirm the feasibility of the forthcoming innovation have already taken place. Every month we propose dispatching 10 such trains to various destinations with 50 flatcars each, in turn carrying two containers each.

If the experiment is successful, and we are counting on success, shipping times will be reduced significantly. This will mean an increase in the authority of Soviet transportation -- especially in the railroad sector. This is all the more important today due to the completion of the Baikal-Amur Mainline. With its introduction, shipping possibilities will become virtually unlimited.

12746
CSO: 1829/29

JOINT USSR-HUNGARY-YUGOSLAVIA RAILWAY CONFERENCE

Moscow GUDOK in Russian 22 Sep 84 p 3

[Unattributed conference report: "A Conference Was Held"]

[Text] In Moscow, on 20-21 September, a conference was held for the central bodies in charge of rail transport of the Soviet Union, Yugoslavia and Hungary.

The Soviet delegation was headed by the USSR Deputy Minister of Railways V. S. Kolpakov, the Yugoslav delegation was headed by the Chairman of the Business Committee of the United Yugoslav Railroads Z. Nastic, while the Hungarian delegation was headed by the General Director of the Hungarian State Railroads R. Bajusz.

The conference discussed questions stemming from the Agreement Between the Governments of the USSR, Yugoslavia and Hungary on Shipping Freight Between the USSR and Yugoslavia in Transit Over the Hungarian Railroads. Such conferences have been convened since 1 November 1965, when the Agreement came into force.

The session in Moscow reviewed the fulfillment of the shipping plan over the last 8 months and discussed measures to carry out the plan up to the end of the current year, including handling the increasing deliveries of aluminum oxide from Yugoslavia to the Soviet Union. Significant attention was given to the development of the progressive method of container shipments and here they pointed to the necessity of making maximum use of medium-tonnage containers as well as employing large-capacity ones. Weights were approved for the use of freight cars in payments between the Yugoslav and Soviet railroads and they discussed the methods of improving the quality of freight packaging and crating. It was announced that the foreign trade organizations and railroads of the USSR and Yugoslavia would take additional measures to ensure an even volume and range of shipments for foreign trade freight up to the end of 1984.

The participants of the conference which was held in a professional, friendly situation signed the corresponding protocol.

10272
CSO: 1829/31

TRANS-USSR CONTAINER SHIPPING PITCHED TO SWEDES

Moscow GUDOK in Russian 18 Oct 84 p 3

[Article by L. Il'ina: "USSR--Sweden: Prospects for Cooperation"]

[Text] On 16 October a meeting was held at the Ministry of Railways between the USSR's minister of railways, N. S. Konarev, and Sweden's minister of transport and communications, C. Bostrom. Also participating here was Sweden's ambassador to the USSR, T. Ern.

N. S. Konarev talked about the structure of our country's railroad business, about the operation and prospects for development of the Soviet steel mainlines. He expressed the opinion that the railroad connections between the two states could become much more intensive. Why not, for example, set up the hauling of containers from Sweden to Japan and other countries of Southeast Asia through Finland and the Soviet Union with re-loading only at the border between Sweden and Finland? Or through the ports of Leningrad and Riga? The guaranteed time period for hauling containers between the Baltic Sea and the Pacific Ocean would be 15 days, and this could be further reduced. The same type of direct railroad connection could also be set up between Sweden and a number of other states bordering on the USSR. Japanese and West German firms have long been utilizing such a "bridge" and have found it to be profitable. Direct passenger communication between Moscow and Stockholm by way of Finland could likewise be of interest for tourist firms.

C. Bostrom declared that these proposals would be received in his country with a great deal of interest, inasmuch as half of all Sweden's industrial products is exported. But, in general, during the last few years the railroads of this Scandinavian country have been undergoing difficult times; the volume of passenger and freight hauls has sharply declined. At present the government is examining the possibilities of creating a system of close and profitable mutual cooperation among all types of transport, which would meet the contemporary requirements of the Swedish economy. In particular, new prerequisites are being sought out for the development of railroads, and it is intended to increase the volume of freight hauls 10-fold during the next few years. In the spring of next year the government will adopt a decision concerning the development of this type of transport.

N. S. Konarev noted the broad opportunities for scientific and technical cooperation between the two countries. Long-lived and good memories regarding the reliability and high quality of Swedish products were left by those steam locomotives

which had been ordered in Sweden by V. I. Lenin and which played a large role in the emergence of Soviet Russia's railroad transport. Its intensive development today requires qualitatively new solutions in such spheres as automating the hauling process, development of track maintenance, high-speed passenger traffic, increasing the effectiveness of using rolling stock, and many, many others. Cooperation in solving these problems could be very fruitful for both countries.

The meeting was conducted in a business-like, friendly atmosphere.

2384
CSO: 1829/43

NEW SERIES 'I' METRO CAR IN TESTING IN MOSCOW

Moscow TRUD in Russian 1 Aug 84 p 3

[Article by N. Gusarov: "New Resident of the Underground Routes"]

[Text] The new series "I" cars are undergoing tests at the Krasnaya Presnya Electrical Depot.

"All aboard!" Yevgeniy Andreyevich Ivanov, an operator instructor, hospitably opened the door to the new subway car.

From the first glance it is obvious how the car, created by machine builders in the city of Mytishch near Moscow, is much roomier than its predecessors. The unusual hexagonal cross section increases its capacity by 30 people. The doors are wider and the interiors are improved.

However, the main surprise was ahead. The consist smoothly moved from the station, rapidly gathering speed and entered a tunnel. Astonishingly, we didn't hear the clickty-clack of the wheels. It didn't seem as if we were in a subway car, but in an automobile on a good road.

Ye. Ivanov explained, "I have worked on the Metro since 1957 and this is the best car I have ever driven. It is comfortable to passengers and operators alike. It has an excellent field of view, a comfortable seat, and many automatic devices. Feel how softly it rides? Instead of the usual springs there are pneumatic shock absorbers reducing noise and making the ride smoother. In addition, the use of aluminum alloys made the car three tons lighter, reduced rail stress and improved its operational qualities."

Muscovites and visitors to the capital can now see the new cars on the Moscow Metro Ring Route, where they are undergoing tests. It won't be long before the beautiful and elegant cars appear on all the subways in the country. The Mytishch Machine Building Plant has begun preparations for the series production of "I" series cars.

11574
CSO: 1829/407

MORE ON NEW 'I' SERIES METRO CAR TESTING IN MOSCOW

Moscow GUDOK in Russian 12 Sep 84 p 4

[Article by B. Kolesnikov, from Mytishchi--Moscow: "All Dots Over the 'I'"]

[Text] ...Each day at the Krasnaya Presnya Electric Train Depot a new consist heads out to make regular trips on the Ring Line of the Moscow Subway. It is still called experimental. But soon all the dots will be placed over the "i" and the new trains will be leaving for the underground routes.

At the dawn of the 1930's, when the first Soviet subway was born, specific rolling stock was created for it. For designating the types of these cars, they began to use the letters of the Russian alphabet. At present, several modifications of this rolling stock of the "Ye" type are being operated on all the nation's subways. But they no longer fully satisfy the demands made.

One is further convinced of this in becoming acquainted with a car of the "I" series. In truth, according to the new indexing, it carries the number "81-715" for the head car with a control booth and "81-716" without a booth and with a panel for switching work.

How does the "I" car differ from its predecessors? I asked the senior scientific co-worker of the subway car laboratory of VNIIvagonstroyeniya [All-Union Scientific Research Institute for Railway Car Building], V. Maleyev.

"First of all, in its unusual shape," replied Vladimir Vasil'yevich [Maleyev]. On a sheet of paper he drew a design. "Here is the circular tunnel. The existing cars have a rectangular body and for this reason do not sufficiently utilize the free space of the underground routes. The geometry of the 'I' car bodies is hexagonal. It is best in terms of the conditions for meeting the dimensions of the tunnel. Due to this it has been possible to increase the floor area and the benches for the passengers have been moved back to the side walls of the deeper body. The passageways have become wider and now it is possible to easily place an additional 20-25 persons. Hence during the peak hours each 8-car consist will be able to take 'onboard' an additional almost 200 passengers. This is the equivalent of coupling on another car...."

The weight of a car is 3 tons lighter since the body has been made from aluminum alloys.

The traffic intensity of the light blue expresses is high. However, the distance between the stops is short and they are constantly braking right after picking up speed. For this reason consists of the "I" cars have been equipped with a regenerative braking system with the electric power being returned to the grid. They will save almost one-fifth of the electric power used on traction.

We have become accustomed to subway comfort. But transport fatigue--there is now such a term--on the long subway lines is very tangible. In a car of the "I" type many design innovations have been incorporated and these will make a trip on it less fatiguing both for the passengers and for the operators.

"What do the operators think about the new cars?" I asked a depot veteran Ye. Ivanov, an instructor operator who had participated in all stages of the testing.

"In our subway we have never had such a comfortable and modern car," Yevgeniy Andreyevich [Ivanov] felt. "Let me start with the operator's booth. It is noticeably bigger and the view is better. In its compartment they have employed noise-abating surfaces and this significantly improves working conditions. And a further convenience for us is that the booth has a good microclimate and this is created by an air cooling and heating system and a comfortable seat. The appearance of the consist is a pleasure to see in its elegance."

The new car has already passed its tests but design thought has not been content with this. In the Subway Laboratory of the VNIIvagonstroyeniya [All-Union Scientific Research Institute of Railroad Car Construction] they are now reflecting on future models which will be delivered to the underground tracks in 10-20 years.

10272
CSO: 1829/32

MOSCOW METRO KIROVSKO-FRUNZENSKAYA LINE EXTENSION DESIGNED

Moscow VECHERNYAYA MOSKVA in Russian 13 Sep 84 p 2

[Interview with Vladimir Nikolayevich Kiselev, design engineer of Metrogiprotrans, by VECHERNYAYA MOSKVA, correspondent S. Akzhigitov: "The Eastern Subway Spur"]

[Text] Two new stations will be opened on the Kirovsko-Frunzenskaya Line.

Here is what the chief design engineer of Metrogiprotrans [State Planning and Research Institute for the Construction of Subways and Transportation Facilities], V. Kiselev, told the VECHERNYAYA MOSKVA correspondent:

[Answer] Let me begin by recalling that the first section of the Kirovsko-Frunzenskaya Line opened in 1935 connected Sokolniki via the city center with the Park of Culture and Rest imeni M. Gorkiy. Later the metro line was extended to the southwest, initially to Sportivnaya Station and then to Yugo-Zapadnaya [Southwest] Station.

In 1966, the underground line was extended from Sokolniki to Preobrazhenskaya Ploshchad'. The inhabitants of the rapidly growing Kuybyshevskiy Rayon gained convenient communication with the city center.

But in time the end station Preobrazhenskaya Ploshchad' had a difficult time handling the growing passenger traffic. Certainly numerous bus, streetcar and trolley bus routes cross here.

Now with the rapid development of housing construction the load on Preobrazhenskaya Ploshchad' Station has increased even farther. So upon the demand of the voters here they have decided to build a new subway route from Preobrazhenskaya Square to Podbel'skiy Street. This will help provide a comprehensive solution to the transport problem in this part of the city.

[Question] Vladimir Nikolayevich [Kiselev], many of our readers are interested in this subway section. Please tell us about it in more detail.

[Answer] The first station on the new subway line will be Cherkizovskaya with underground and ground lobbies and located near the Central Locomotive Stadium. Tens of thousands of sports fans will be able to quickly and comfortably make their way to the sports complex. Cherkizovskaya Station has been designed as a single-arch one like the Perovo, Skhodnenskaya and Babushkinskaya Stations.

The other station "Podbel'skiy Street" is located by the tramway ring not far from the bridge crossing the tracks of the Malaya Okruzhnaya Railroad. This is a station of the column type with two underground lobbies and exits to the Otkrytoye Shosse and Ulitsa Podbel'skogo.

[Question] When do they plan to open the new section?

[Answer] Plans have been approved for building the Preobrazhenskaya Ploshchad'--Ulitsa Podbel'skogo route. Specialists from our institute are now producing the working plans. The subway builders at present have begun to set up the construction areas in erecting the service facilities and shops and hauling in the necessary equipment.

Train traffic from Preobrazhenskaya Ploshchad' to Ulitsa Podbel'skogo should be started at the end of the 12th Five-Year Plan.

10272
CSO: 1829/32

MOSCOW METRO POWER SYSTEM MODERNIZATION NEARLY COMPLETE

Moscow MOSKOVSKAYA PRAVDA in Russian 2 Oct 84 p 3

[Article by V. Bezbrezhnyy: "Having Crossed the 'Threshold'"]

[Text] There is a direct linkage between the fact that many electricians on the Moscow Subway have once and for all discarded their greasy overalls and the trains on the underground tracks have begun to be more frequent. These are two aspects of one phenomenon due to which the nation's first subway has gained a second youth. It is a question of the many years of enormous work which has now come to conclusion.

This TASS correspondent was invited to travel to Turgenevskaya Station, and then asked to go behind a gate into the track tunnel. Several steps along a narrow gallery along the tubular wall and then a turn to the left into a deep corridor. There was a massive door like an enormous safe. Keys rattled.

Approximately 10 years ago, the Moscow Subway, as specialists felt, had reached the limit of its capabilities. The rapid development of the capital demanded a sharp increase in traffic but capacity was depleted. The electric supply system had become a "stumbling block." For the subway this was life itself. Everything here, from the trains to the shining letter "M" on the ground-level lobbies was powered by electricity. Hence, in speaking in technical terms, the operational parameters of the electric supply system had reached their limit. The question arose of a complete reorganization of all its elements.

The door opened and we went in. Lights blazed on the ceiling of a long hall. We were in the room of one of the traction step-down substations. This one located at Turgenevskaya Station had been selected as a typical example among many similar ones.

Gray-blue metal lockers stood in rows. In the neighboring hall, there were two similar ones only larger. However, the subway workers showed this equipment with pride. In front of us was the basic power supply element providing traction for the trains, the running of the escalators, signaling, ventilating and lighting equipment, in a word, all the vital activities of the section served by the substation. The two large cabinets contained dry transformers. The smaller ones held the electromagnetic switches. All the equipment was of a fundamentally new design. Before this for scores of years they had used oil transformers and switches which in all regards were inferior to the present ones.

When necessity forced them to consider a significant increase in capacity, the subway workers immediately had to reject the notion of installing additional equipment. There was no place to put it. To make new excavations underground would be irrational and costly. One solution presented itself: to develop equipment which with significantly greater capacity could be installed in the former areas.

The task was not an easy one as there was no analog for solving it in the nation. Setting to work were the collectives of the Electric Substation and Network Service of the Moscow Subway, Metrogiprotrans [State Planning and Research Institute for the Construction of Subways and Transportation Facilities], the Moscow Institute for Railroad Transport Engineers and the VNII [All-Union Scientific Research Institute] for Railroad Transport. A contract was concluded on creative collaboration with the Uralelektrotyazhmash [Urals Heavy Electrical Machinery] Plant in Sverdlovsk and other enterprises of the nation's electrical industry were called in.

In front of us was the result of this work. We were standing in the middle of a spacious and completely empty room adjacent to the transformers. Inevitably the question arose of what was all this room with a rigid saving in underground excavation? It was explained that this was a carryover from the previous equipment. When an oil transformer required maintenance or repair, the enormous machine was moved here. The work was dirty and oil spilled all over the floor. Now where one of them stood there are two transformers. They are smaller in size but their capacity is significantly greater. And it was completely clean. The "oilers" were a thing of the past. And the still empty room was a reserve for the future. When capacity had to be increased further here they could locate the additional equipment.

The new equipment also required more progressive methods for controlling it. The TASS correspondent visited the communications house of the Moscow Subway on Herzen Street. We went up to a small panel where there was the control panel and console for the Kaluzhsko-Rizhskaya Line. In front of the dispatcher was a light diagram of all the power installations. Without leaving one's seat, it was possible to control the installations individually and this could be done by program, that is, by a single command to turn on or off an entire complex. A single dispatcher operated the entire line or even two together.

Such complete centralization is an innovation. It increased the efficiency and reliability of control and made it possible to give up many manually operated devices at the stations. Where previously scores of minutes were spent, now it was a matter of a few seconds. This made it possible, in particular, to increase the working time of the nighttime "windows" where each minute is worth its weight in gold.

Without going into details, let us add that the equipment troubleshooting system has been improved. A new system has been introduced for protecting the electric traction work from emergency conditions. The necessity of this has been caused by the intensification of the traffic schedule, by the increase of consists with more powerful engines and by increased speeds. The use of electronics has made it possible to avoid laying hundreds of kilometers of power cables and building additional units. The heating system for the stairwells

has been made more efficient, and a brigade method has been introduced for maintaining the electrical equipment and this includes all the best achievements in this area.

The overall result is that the Moscow Subway has been able to cross a critical threshold and substantially increase carrying capacity. Just one example: the Zhdanovsko-Krasnopresnenskaya Line was designed for 30 pairs of six-car trains an hour but now it handles up to 40 pairs of eight-car ones. The underground routes of Moscow have handled the increased passenger traffic which has recently increased by tens of millions a year.

All that has been done over the last decade on the Moscow Subway has benefited not just the system. The technical advances have been successfully employed or are to be introduced on the subways in operation or under construction in the nation. The experience of the "elder" will serve well for the "younger brothers" in other cities.

10272
CSO: 1829/32

POOR LOADING FACILITIES HINDER KUZBASS COAL RAIL SHIPMENTS

Moscow SOVETSKAYA ROSSIYA in Russian 29 Sep 84 p 2

[Article by G. Shalakin, journalist: "Coal Accumulates at Mines"]

[Text] Kemerovo Oblast--Kuzbass miners have long dreamed of mining 150 million tons of coal in a year. This cherished goal just can't be achieved. This year's plan is in danger of failure: the deficit is over 2 million tons. Old problems such as slow mine reconstruction and delays in preparing the extraction area are blamed for this. Meanwhile, new problems are occurring. Why?

Kemerovo Railway management specialists arriving at the Yesaul'skaya mine industrial yard did not expect to meet the distinguished miner and Hero of Socialist Labor, G. Smirnov. This well-known brigade foreman of the Yubileynaya mine in Novokuznetsk was not there by accident. A month ago Yesaul'skaya, growing out of the surrounding woods, was given the status of an independent enterprise and Gennadiy Nikolayevich was named Deputy Mine Director in charge of production. Smirnov's mining operation is going well. Production is approaching 80,000 tons per month. The new manager is troubled by another problem: how to ship his coal?

"We've got 60,000 tons there," he said pointing to a black mountain near the railroad tracks.

Ye. Val'kov, Kemerovo Railroad director, of course suspected the reproach was directed at him, although logically it should be addressed to his association managers and transport construction personnel. All the more so since the Yesaul'skaya mine was not alone in this situation.

Here we must digress a bit. About 20 years ago a new electrified Tomusinskaya-Artyshta railway line was built around the highly industrialized centers of the Kemerovo Oblast. It was to provide a means of shipping Yerunakov and Karakan area coal. There are reserves here adequate for a century. The coal deposits consist of thick layers suitable for open-pit and underground extraction.

Loading stations and well developed access to industrial facilities are required to fully implement the rail line's capacity. Unfortunately, these do not exist in the new coal mining areas of the Kuzbass.

The Gidrougol' Association's Yesaul'skaya mine ships from the Kuregesh station. It is premature to consider Kuregesh a coal-loading station, although a long period has passed since its formation. Eighteen years ago coal from the Kemerovougol' Production Association's Baydayevskiy open-pit operation began to be shipped from the station. Thus, no heavy railway facilities appeared either at the access roads or at Kuregesh.

"Our shipping isn't growing and won't grow" is the current opinion of Kemerovougol' specialists responsible for construction and transport. "Gidrougol' is growing, let it take care of the Kuregesh station."

Gidrougol' officials also want nothing to do with the matter. The association designed the Kuregesh-2 coal handling facility project. Then it took up the role of construction buyer. Unfortunately, the contractor is achieving only mediocre results. Only half the project has been completed after 2 years and the expenditure of more than 2 million rubles.

But there will still be coal and it must be shipped. At present volumes there should be some 150 people working at the Kuregesh station: car washers/cleaners, rolling stock fitters/inspectors and mechanics, loadmasters, freight clerks, etc. The Kemerovo Railroad executives met the miners halfway. At their own risk they hired 16 people. A great expense in wages alone. Then add to this the other railroad losses. There is a shortfall of many thousands of rubles from diverting rolling stock to carry coal unprovided for in the plan.

"What will it be like from now on?" the deputy director of the Yesaul'skaya mine, G. Smirnov was asked by Kemerovo Railway Director Ye. Val'kov, "What are your suggestions?"

"We've taken on part of the construction work" Gennadiy Nikolayevich answered. "With the railroad workers we're now installing a welding line."

"That's right," Ye. Val'kov agreed, "But you understand it's only a temporary alternative."

Temporary alternative indeed! These "temporary alternatives" have become part of the system at many Kemerovo Railway stations. The activation of the first phase of the Yerunakovo freight handling yard was planned for now. These hopes were destroyed by the collective of the Kuzbasstransstroy [Kuzbass Transport Construction] Trust. It has assimilated half of the 8 million rubles allocated. The miners do not believe in it, and neither do the railroad workers. From the beginning of the 5-year plan, the trust has been permanently in debt to contractors for Kemerovo Railroad projects. There is still the task in the coming years (there is no other such specialized organization in the Kuzbass) of modernizing eight stations with Ministry of the Coal Industry funds and the performance of a tremendous volume of work for the Ministry of Railways. It is clear even today: the present amount of work

Kuzbasstransstroy has is beyond its capability. The trust does not have the resources of a modern construction enterprise. There is practically no reconstruction of operational facilities. Kuzbasstransstroy staffing is at 73 percent.

"We have hundreds of projects and we are not succeeding anywhere," states N. Chubarev, trust director.

In the Kemerovo Oblast it is not hard to find many examples of a composite approach to the solution of complicated production and social problems. One such example occurred during the construction of the Western Siberia Metallurgical Plant in Novokuznetsk where a huge housing complex was built at the same time as the plant itself. Now, yet another "microrayon" is building up on the opposite bank of the Tom River. The plant is operating steadily and there have been no staffing problems. How can the current situation be mastered without the need for temporary alternatives on the part of railroad workers and miners. There are many opinions. Specifically, it is proposed that construction teams finishing up their work on the Baikal-Amur Mainline be invited to the Kuzbass to form the basis for a "Glavkuzbasstransstroy" [Main Kuzbass Transport Construction].

L. Gorshkov, first secretary of the Keremov Oblast party committee, met recently with oblast center students. He said that by 1990 coal production in the basin must be significantly increased and that this would require serious, unconventional decisions. And in the meantime? In the meantime, transport construction workers are operating according to the saying: wherever the curve leads. First of all, their slow development hinders the movement of fuel- and coking-grade coal from the new regions.

A new fuel complex, larger than the previous facility, is under construction in the Kuzbass. To approach its development with old standards is to delay the basin's rebirth for an indefinite period. It appears that the solution of severe transporation problems arising in connection with the new coal regions depends largely on the speed with which the Ministry of Transport Construction takes up the formation of competent construction organizations capable of projects with industrial and social/domestic orientations. The Ministry of the Coal Industry will fulfill the decisions it has made earlier.

Something else can be noted if the Kuzbass is looked on from a wider perspective as a general supplier of valuable coking-quality coal. Nearly a dozen ministries are working independently in the new regions. Reference should be made to the experience of petroleum and natural gas workers in Siberia. In order to develop field efforts and transportation in a balanced fashion a territorial interdepartmental commission was set up in Tyumen under the USSR State Planning Committee. A similar organization is required in the Kuzbass.

12746
CSO: 1829/29

NORTH CAUCASUS PROKHLADNAYA-BESLAN LINE ELECTRIFIED

Moscow GUDOK in Russian 4 Oct 84 p 1

[Article by B. Shipitsin: "Electric Locomotives Underway"]

[Text] Prokhladnaya-Beslan--North Caucasus Railroad workers were servicing 2,600 kilometers of electrified lines until recently. Now in the last days of September yet another section of the main Prokhladnaya-Beslan passenger route has been readied.

Some 80 kilometers would seem to be insignificant on a route which stretches between three seas. But railroad workers, members of the Ordzhonikidzetransstroy Trust, party members and representatives of Soviet organizations in the Stavropol Kray and North Ossetia have anxiously waited for this day.

And the day came. Three months prior to their deadline, construction personnel of unit SMP-324 and other Ordzhonikidzetransstroy Trust organizations finished all start-up adjustment work and placed the next-to-last segment of the main passenger route in operation. On 28 September at 1300 (local time) Prokhladnaya depot engineer V. Pintyashin, fellow engineer V. Klimenko and engineer/instructor Yu. Levchenko started their VL60K series electric locomotive No. 488 on the initial Prokhladnaya-Beslan run.

Depot workers had prepared well prior to dispatching the first electric locomotive on the new route. They had selected the locomotive earlier and decorated it with festive red decals.

Station windows and open country flashed by unnoticed and we were already approaching Beslan. The festively decorated station platform featured an improvised grandstand. The train was met with bread and salt by representatives of the North Ossetian Republic. Boys in circassian coats and girls in national costume presented the engineers with the traditional biscuit and salt. Pioneers congratulated the mineral railway workers present at the occasion, the builders and their guests and presented them with flowers.

On the platform there was a lively meeting to celebrate the opening of the new electrified section. S. Kokayev, chairman of the Pravoberezhnyy

rayon soviet of people's deputies, opened the meeting. V. Tsalagov, second secretary of the Pravoberezhnyy rayon party committee of the Communist Party of the Soviet Union, V. Isayev, deputy director of the North Caucasus Railroad, and others congratulated the constructors and railroad workers on their early completion of the work.

Assembly brigade foreman, A. Sidakov, of the Ordzhonikidzetransstroy Trust spoke on behalf of the construction and railroad personnel who participated in the section's electrification.

Now the last section (Beslan-Groznyy) of the main passenger route remains to be opened. Construction and power personnel feel that there is a real possibility of finishing all work ahead of schedule.

12746
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BAM BRIDGE BUILDING TECHNIQUES NOMINATED FOR STATE PRIZE

Moscow PRAVDA in Russian 9 Oct 84 p 3

/Article by Academician P. Mel'nikov, director of the Permafrost Institute, Siberian Department of the USSR Academy of Sciences, Hero of Socialist Labor: "The Bridges of the BAM: In Competition for the USSR State Prize"/

/Text/ The BAM /Baykal-Amur Mainline/ is an amazing complex of transport structures, including the railroad track with bridges and tunnels, sidings and stations, diverse services and housing settlements. The right-of-way passes through the mountainous regions of Eastern Siberia and the Soviet Far East with their numerous river gorges, and this has required the construction of more than 2500 bridges.

Their construction has been considerably complicated by the lack of roads, the prolonged cold winter, permafrost, and a high incidence of earthquakes. Additional difficulties have been caused by the lack of local construction materials suitable for building bridges.

If by the beginning of the BAM's construction the bridge span structures were already being made in plants, hauled in the form of ready-made components, and then either assembled or installed whole at the site, the piers and footings were made by hand with the help of jack hammers. In addition to enormous outlays of labor, this led to a violation of the natural environment--permafrost soils thawed out, the cycle of the surface and underground waters was altered, and layers of ice began to appear on the bridge crossings. The time periods required for building bridges became considerably longer.

In order to ensure the construction of the BAM within the assigned deadlines, it was necessary to abandon the traditional piers with footings being constructed in pits. What was required were pier designs new in principle, along with a new technology for installing them.

Analysis of many years of construction experience under harsh natural conditions has shown the following: the piers with the best prospects for small and medium-sized bridges are those of the non-grillage foundation type, consisting of from two to six heavy-duty, vertical, reinforced-concrete components and a slab joining them on top. The span structures and the railroad bed rest on this. Experimental bridges were built on the BAM--Tynda Railroad Line. Pier structures made of reinforced-concrete columns were developed, along with planning norms and the

technology; fittings were created for making the pier components at a plant and erecting them on the site by means of industrial methods.

The work by the group of scientists, designers, and builders concluded with the adoption of design-technological solutions which were new in principle. Thus, fully pre-fabricated bridges began to appear which were made of reinforced-concrete and steel elements of plant manufacture. The most essential links in the engineering solutions for the bridge piers have become the footings made of reinforced-concrete, cylindrical columns, to be finished in holes previously drilled in the ground, as well as fully transportable, reinforced-concrete packings and casing assembly units. Trailer-trucks were used to haul these elements and truck-mounted cranes were utilized to install them. Drilling the holes is perfomed by highly productive machines.

Sharp reduction in the volume of structural components, an increase in the degree of their pre-fabrication, the delivery of elements for each facility in complete sets all facilitated the extensive introduction of industrial methods of operational production, a substantial reduction in the volumes of transport hauls, improvement in the organization and planning of bridge building.

Up to 95 percent of the materials used for bridge piers are now processed under plant conditions into precast elements. Operations have been completely mechanized. There has been an improvement in the quality of construction, while violations of the environment have been reduced to a minimum.

In order to erect the footings and the piers, a specialized sub-division has been created. It includes brigades which have been outfitted with mobile drilling complexes. They work by the shift method in accordance with a brigade contract. If it previously required three or four months to build the piers for a small bridge, now two or three weeks are sufficient.

In building large bridges use has been made, instead of the traditional caissons, of precast, reinforced-concrete shell components which are then sunk into the ground by force. In order to protect the parts of large bridges above the footings from floating ice, use has been made, instead of granite facing, of reinforced-concrete blocks with increased strength. They have been made with the help of a special installation.

This collective work has been protected by a number of patents on inventions; its results have been reflected in All-Union norms of construction planning, in publications and reports in our country and abroad.

The economic effect obtained from introducing the new design-engineering solutions merely in building bridges on the BAM has amounted to almost 100 million rubles. Labor outlays have been reduced by 2 million man-days. The ahead-of-schedule opening up of train traffic through the sections of the mainline has saved additional hundreds of millions of rubles; this is testified to, in particular, by the operational experience of the BAM--Tynda--Berkakit Line.

The work of the group of inventors and staff members of the scientific-research, planning, design, and bridge-building organizations of the USSR Ministry of Transport Construction with regard to developing and introducing new and effective methods for erecting bridges under the complex conditions of the BAM are worthy of being nominated for the USSR State Prize.

2384
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FACTORY TESTING OF NEW VL-15 12-AXLE ELECTRIC LOCOMOTIVE

Moscow GUDOK in Russian 17 Oct 84 p 1

/Article by S. Babayan, GUDOK correspondent: "The Most Powerful"/

/Text/ At the Tbilisi Electric Locomotive Building Plant imeni V. I. Lenin testing has begun of the new, heavy-duty VL-15 12-Axle Electric Locomotive.

Early morning. The shift has not yet begun, but here in the experimental workshop work is already in full swing. Plant testing is an important stage in preparing machines for serial production. And, therefore, each of the creators of the new locomotive is in a special, pre-start mood today.

"This mainline d.c. electric locomotive is capable of hauling a large amount of freight weighing more than 8,000 tons. You know, its capacity at its normal speed is more than 9,000 kW," states the chief engineer of the Elektrovozostroitel' Association's Design Bureau, S. Despotashvili. This marks the new electric locomotive to good advantage over all the previous series. The heroic potentials of this machine are determined by the TL-3 traction engines with a capacity of 750 kW. Tests have confirmed the rationality of the design of the crew sections. For example, the variant of positioning three trucks on each of the locomotive's two sections has justified itself."

Together with Sergey Nikolayevich, we are inspecting the electric locomotive. The well-thought-out arrangement of the units, the high quality of the assembly--all this testifies to the fact that the Tbilisi people had a very responsible attitude toward their "baby." In the cab of the locomotive we met the test-engineer, Sh. Latsabidze.

"I think that this machine will be to the liking of the locomotive crews," he said. "The cab is spacious; all the instruments and control buttons are positioned so as to create favorable conditions for running large-freight trains. I have tested many models of electric locomotives. This is the most successful both with regard to technical-operational characteristics and comfort. The system of automatic control of the recuperative braking will be of great help for the crews."

"I am convinced that this locomotive will show itself to good advantage in operation," continued S. Despotashvili. "Great participation in developing the plan was undertaken by our leading specialists: G. Chirakadze, D. Georgadze, Ye.

Razmadze, as well as the designers Z. Dzhinchvelashvili, and Ya. Tediashvili. Working on the assembly of this locomotive were the brigade of deputy to the USSR Supreme Soviet, G. Metonidze, and groups headed up by B. Bezhashvili and I. Grigalashvili.

After the completion of the plant tests the new locomotive will undergo testing on one of the heavily traveled freight sections of the Transcaucasian Mainline.

2384
CSO: 1829/43

ELECTRIC LOCOMOTIVE TESTING FACILITIES URGED

Moscow EKONOMICHESKAYA GAZETA in Russian No 36, Sep 84 p 17

[Article by V. Yanov, director of the VElNII in Novocherkassk, Rostov Oblast: "For Tomorrow's Electric Locomotive"]

[Text] Soviet electric locomotives are rightfully considered the best in the world in terms of their traction performance. That is how things stand today. The scientists and designers as well as the electric locomotive builders consider it their duty in the future not only to strengthen the positions achieved but also to attain new goals.

Among the recent developments of the All-Union Scientific Research, Planning, Design and Technological Institute of Electric Locomotive Building (VElNII) are the VL-85 2-section, 12-axle, high-power locomotives. These have been developed considering the requests of the railroad workers who, as is known, have initiated a competition to increase the weight and length of the trains. Special northern-design electric locomotives of this class will haul freight along the Baykal-Amur Mainline which is going into operation.

Specialists from the MPS [Ministry of Railways], have estimated that the use of the VL-85 on a number of major sections in the railroad network would make it possible to increase the schedule weight standard for freight trains by 40-50 percent with maximum utilization of the length of the receiving-dispatching tracks and the static load of the cars.

The efficiency of the new engine is 2 percent better than the present-produced 8-axle VL-80S and VL-80R. The modern regenerative braking system provides an opportunity to return to the grid around one-tenth of the electric power consumed in traction. In terms of specific power consumption, the VL-85 will even be more economic than its less powerful precedessors. Moreover, it wins in those sections where alone it can pull a train of increased weight instead of the presently used unit of two 8-axle engines.

The advantages of the VL-85 are apparent not only in operation but also in maintenance as well as in the production sphere. Labor intensiveness of routine repairs and upkeep have been reduced by 20 percent. In comparison with the 8-axle locomotives which perform the same work using three sections, the new electric locomotive has one third less electrical equipment.

According to the data of the Novocherkassk Electric Locomotive Building Plant (NEVZ), the progressive technical ideas employed in the design of the VL-85 will reduce the proportional consumption of ferrous metals by 18-19 percent and by 15 percent for nonferrous ones, the volume of installation and assembly work will be reduced by 10-12 percent, manufacturing labor intensiveness by 12-15 percent. A preliminary estimate made by the NEVZ for a full annual program promises a savings of 8,300 tons of rolled metal, 3,700 tons of electrical equipment and 3,800 tons of installation wire.

We feel that the responses of the client and the manufacturer--the most captious critics of our work, create an objective picture of the opportunities which will open up with the start of series production for the new electric locomotives.

The VElNII and the NEVZ, in carrying out their joint socialist obligations, manufactured two prototypes 2 years ahead of the established time. It is now a question of testing which should confirm the calculated performance of the engines before they are put into series production. And here there is a "red light" burning on the track of the locomotive which would bring a major national economic effect.

The nation's only integrated scientific-technical center for electric locomotive building does not possess the necessary laboratory and experimental facilities. In order to test the preassembled electrical equipment, we are forced to use one of the VL-85 prototypes as a test stand instead of putting it into experimental operation where in just 1 year it would carry 1.5 billion ton-km of freight.

The institute's laboratories are located in improper facilities rented from the NEVZ. All the experimental models are made at the basic production shops of this enterprise. The test range which the plant has is designed to conduct testing on serially produced engines. Both its load factor and technical parameters do not allow sending the new engines being developed by the institute here. Judge for yourselves: the maximum speed on the plant range is 70 km an hour while the new locomotives "produce" 120-160.

The following example shows what results from such a "truncated" version of a scientific center. Our specialists have developed two different designs for the system of the frame-support suspension of the traction engines. The two electric locomotives equipped with them according to the existing procedure should make a run of around 2 million km each.

If the institute had modern equipment making it possible to simulate the operating conditions, the testing would take 2 or 3 years. But we are forced to turn over the experimental locomotives for testing on the railroad network where, according to the MPS data, the average run of an electric locomotive in a year is 150,000-200,000 km. Thus, for full testing it would take 10-13 years. In 8-10 years, the introduction of the new frame-support suspensions would save around 24 million rubles just in reducing operating expenditures on repairs and the maintenance of the engines and track superstructure.

At the same time, since the start of this five-year plan, the institute should have had an entire facility of engineer and experimental laboratory buildings as well as a railroad testing range.

As yet out of the millions owed for construction, just 520,000 rubles have been allocated. Here things have stopped.

We need the laboratory and experimental facilities as quickly as possible. The institute has been given the task of developing a new AC electric locomotive with an asynchronous traction drive, the VL-86, and standardized controls based upon microprocessor equipment and a microcomputer. We must sharply reduce the weight of the mechanical part of the locomotive. A delay of the work in this area means a voluntary abandonment of the advanced positions we have won. We do not intend to retreat and are counting firmly on effective support from the planning bodies.

10272
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CAR REPAIR INITIATIVE CONTINUES TO SPREAD

Moscow EKONOMICHESKAYA GAZETA in Russian No 37, Sep 84 p 4

[Article by V. Makhovoy: "Railroad Car Repairs--A Concern of All Enterprises"]

[Text] The initiative of the Muscovites to repair railroad cars and containers at the industrial enterprises, in being approved by the CPSU Central Committee, has gained ever-broader support and spread. Over the first half of the current year, some 450,800 cars were repaired in comparison with 289,900 during the same period of 1983, or 55 percent more. Correspondingly, 135,800 containers were returned to use in comparison with 91,200 in January-June of last year.

At present, some 5,800 enterprises are involved in repairing the rolling stock and this is almost 500 more than a year ago.

An example has been set by the initiators of the campaign, the Muscovites, who each month rebuild around 6,000 cars and containers. Good results have been achieved at the enterprises served by the Sverdlovsk, Gorkiy, October, Dnieper, Northern, South Urals, Kemerovo, Southern, Lvov and Kuybyshev railroads.

The highest indicators in rebuilding the cars have been obtained this year at the enterprises of the USSR Ministry of Ferrous Metallurgy (74,300), the Ministry of Chemical Industry (51,600), the USSR Ministry of Construction Materials Industry (48,000), the USSR Ministry of Timber, Pulp and Paper and Wood Processing Industry (29,200) and the Ministry of Mineral Fertilizer Production (27,700).

As for containers, the leaders are the enterprises of the USSR Ministry of Light Industry (24,300), the Ministry of Automotive Industry (12,300), the Ministry of Electrical Equipment Industry (11,300) and the Ministry of Chemical Industry (6,900).

At the Taganrog Metallurgical Plant they have set up a special area for routine repairs on 16 cars a day. Here there are 7 posts for carrying out electric welding, 4 stationery electric jacks and they have equipped shelving for the essential materials and spare parts. The workers in the section by their own efforts have made their own devices for tightening the bodies, for straightening the side doors of the gondolas, the hatch covers and the upper bracing. Car repairs have been organized according to a 12-hour schedule. Since the start of the year this mechanized line has returned 1,622 gondolas to the line.

At the Arkhangelsk Pulp-Paper Combine they have organized a large point for preparing and washing out boxcars and this operates on two shifts. Integrated repair brigades have been organized. A highly productive Donbass-2 repair machine has been installed. Containers are being well repaired at the Mogilev Silk Textile Combine. The textile workers have introduced the necessary production fittings and since the start of the year have returned around 3,000 containers to use.

High praise should also be given to the skillful actions of repairing rolling stock at the Dnepropetrovsk Azot [Nitrogen] Association as well as at the Krivoy Rog, Magnitogorsk and Orsk-Khalilovo Metallurgical Combines. Many similar examples could be given.

At the same time, at the enterprises of the USSR Ministry of Coal Industry, the amount of work relating to routine repairs of the cars has declined by 20 percent. On the Southwestern, Southeastern, Kuybyshev, West Siberian, Krasnoyarsk, and Transbaykal railroads, in comparison with last year, there has been a decline in the number of enterprises participating in this important matter. For container repairs, such a situation has also developed on the Southwestern, Transbaykal and Transcaucasian railroads.

Certain enterprises have concluded agreements with the railroad workers and then do not carry out their obligations or do extremely unsatisfactory repairs. This, in particular, applies to the TETs-2 in Vladivostok, the TETs-1 in Khabarovsk and the Kishinev Elektromashina [Electrical Equipment] Plant.

On the Azerbaijan Railroad, 18 enterprises, having signed agreements, do not repair the rolling stock.

A number of enterprises which possess the necessary capacity have refused to make repairs on cars and containers. These are the coke byproduct plants served by the Donetsk Railroad, Uralmash [Urals Machinery], the Voronezh Tire Plant and the Amur Glass Plant as well as the Karagandaugol' [Karaganda Coal] and Ekibastuzugol' [Ekibastuz Coal] Associations.

The spread of the initiative of the Moscow industrial enterprises is rightly viewed as an enormous aid to rail transport. Everyone needs the cars and containers. For this reason there should not be any uninvolved bystanders in organizing repairs for the rolling stock.

10272
CSO: 1829/31

BRIEFS

KHARKOV METRO--Yesterday, considerably ahead of schedule, the start-up section of the Kharkov Metro's second stage began operation. The five-station subway line links the downtown with the Saltovskiy Massiv, where 400,000 people live. It now takes one-half or one-third as much time as previously to get to the city center. The Saltovskaya line has closed type stations. The tube over the river is like a continuation of the tunnel and protects trains from the weather. Builders and architects were concerned that each station be attractive and convenient. Work is now under way on the last three stations of the metro line's second stage. Construction has begun on the third meridian, running to the Alekseyevskiy residential area, the youngest in the city. [By A. Vyatkin] [Text] [Moscow SOTSIALISTICHESKAYA INDUSTRIYA in Russian 12 Aug 84 p 2] 11574

NEW DIESELS FROM GDR--The collective at the Machine Building Plant imeni G. Bailmer in Hennigsdorf (GDR) delivered their Soviet customers a large group of new high powered diesel locomotives. In an interview with a TASS correspondent, Ekrad Martin, the plant's deputy director, noted that this group of locomotives marks a new stage in our joint work. Close contacts with Soviet designers, enterprises and specialists made it possible to accelerate the new engines' development and to adapt to specific conditions as much as possible. The cab is air conditioned and has a panoramic field of view. The operation of the main engine and other equipment is electronically monitored. The Hennigsdorf Machine Building Plant is the GDR's leading enterprise in this branch of the economy. It builds diesel and electric locomotives which are operating successfully in many nations, including the Soviet union. The EL-20, the production of which begins next year, will soon be added to its products. [By TASS correspondent A. Korniyenko] [Text] [Moscow GUDOK in Russian 14 Aug 84 p 3] 11574

CSO: 1829/407

DEPUTY MINISTER CALLS FOR IMPROVED SHIPPING PLANNING

Moscow MORSKOY FLOT in Russian No 9, Sep 84 pp 2-4

[Article by V. Nikolaychuk, deputy minister of the maritime fleet: "Improve Planning of Maritime Shipping"]

[Text] In fulfilling decisions of the 26th CPSU Congress, the Ministry of the Maritime Fleet is solving the tasks of complete and timely satisfaction of the national economy's and population's shipping requirements, raising work efficiency and quality and simultaneously reducing transportation costs and ensuring its own active role in the country's foreign economic relations as well as increasing participation in the formation of the balance of payments. Maritime transportation handles considerable volumes in shipping cargo of Soviet foreign trade, thereby ensuring its independence from the diktat of foreign shipowners and ensures delivery in planned volumes and transshipment in ports of imported food cargo (grain, sugar, meat and some other goods) as well as delivery of cargo to ports in Cuba, Vietnam, Kampuchea and in developing African and Asian countries and quite often under complex political circumstances not letting most aggressive individual countries carry out an economic blockade against some developing countries.

An important role belongs to maritime transportation in ensuring the realization of party and government decisions on accelerated development of productive forces in the vast regions of the Far North, the Far East, Chukotka, Kamchatka and Magadan Olbast. More than 90 percent of supply cargo is delivered to these regions by sea.

Comrade K. U. Chernenko, general secretary of the CPSU Central Committee, said in his speech at the February (1984) plenum of the CPSU Central Committee: "As regards the basic directions in the development of our economy, they have been clearly defined by the party. Intensification and accelerated introduction in production of scientific and technical achievements and implementation of major comprehensive programs--all of this in the final analysis should raise to a qualitatively new level the productive forces of our society."

Putting these fundamental decisions into practice in the maritime transportation sector requires constant improvement of technical means, strengthening the role of economic indicators and incentives in raising the effectiveness of fixed capital utilization, improving planning and management and reducing ex-

penditures for cargo and passenger transportation. One of the most important ways for intensifying the work of maritime transportation and raising its efficiency is by accelerating scientific and technical progress.

Planning the development of maritime transportation enterprises in an intensive way presupposes accelerated and efficient utilization in the fleet, ports and ships repair plants of the enormous scientific and technical potential that is at the disposal of our country and reducing the periods and expanding the scale in introducing new scientific and technical ideas.

Introduction of scientific and technical progress achievements in the sector is of decisive significance in raising the intensiveness of the transportation process.

Plans for social and economic development of maritime transportation provide corresponding resources for scientific research, experimental work and introduction in production of leading equipment and technology.

In view of the increased scale of our work and the complication of internal economic and foreign trade relations, one of the basic directions in improving planning is the establishment of economic and organizational conditions for introducing achievements of scientific and technical progress in maritime transportation. Therefore, prognoses of scientific and technical development must be worked out in long-range and current plans and directed comprehensive programs that are correlated with corresponding sections of a plan for social and economic development of maritime transportation must be compiled. In developing directed programs it is very important to provide for close interaction of plans for the development of maritime transportation with plans for the development of other types of transportation and economic regions.

At the same time, it should be noted that the shortage of funds being allocated for introduction of scientific and technical progress achievements, replenishment of the fleet and fitting it out with latest vessels makes it impossible to ensure the necessary rate of the sector's development.

During the years of the 7th-10th Five-Year Plans, maritime transportation developed in the main in accordance with the needs of the national economy. The fleet of the MMF [Ministry of the Maritime Fleet] was replenished with a considerable number of modern vessels and the deadweight of the transport fleet increased from 8.4 million t in the 7th Five-Year Plan to 16 million t by the beginning of the 10th Five-Year Plan. This has made it possible in the main to solve the task of satisfying the needs of the national economy in shipping cargo by sea and in ensuring the independence of Soviet foreign trade from foreign shipowners. However, a tendency has already formed in the 10th Five-Year Plan toward reducing the rate of maritime transportation development, which has created substantial difficulties in satisfying the needs of the national economy in transporting cargo and passengers. Owing to insufficient replenishment of the fleet with new vessels, its structure at the present time does not fully correspond to the nature of shipments. A shortage is being felt in such specialized vessels as containerships, timber carriers, ro-ro

vessels, bulk carriers and tankers of low and medium tonnage. Along with the increased share of specialized vessels, the replenishment of the fleet as a whole has substantially slowed down and the number of vessels that are more than 10 years old has increased.

Obviously a solution to these problems must be found during development of plans for the 12th Five-Year Plan. In the process it should be borne in mind that in view of limited resources it is necessary not only to thoroughly consider the structure of new shipbuilding by placing the emphasis on building most modern types of vessels, but to an equal degree to adopt measures aimed at modernizing the operating fixed capital and ensuring intensification of its utilization. Planning improvement acquires special significance under these conditions. The following basic directions in improving planning in the sector can be singled out.

First of all, it is raising the quality of economic analysis and prognosticating the activity of maritime transportation enterprises.

Economic analysis is a study substantiated by a certain method of the production process, the work of a vessel, a group of vessels, a port and a shipping company by means of "division of the whole" into constituent elements. The purpose of the analysis is to discover the factors which have influenced the level of fulfillment of planned tasks and effectiveness of utilization of the fixed capital and material, labor and financial resources.

The level of production development and utilization of production capacities is determined by means of analysis. Conclusions of a systems analysis of the financial and economic activity of enterprises constitute the initial data for substantiating a plan.

The next direction is introduction of an automated system of plan calculations. Broad utilization of electronic computer technology in solving planning tasks provides great opportunities in the collection and processing of information, classification of data, variation of calculations and so forth. An automated system of plan calculations makes it possible in a relatively brief interval of time to collect a considerable mass of information, compare the results of its processing with the fixed capital utilization norms, expenditure norms and other assigned quantities, to obtain versions of planned tasks with regard to fixed capital utilization (the fleet, ports and so forth) and to select a version that approaches the optimum (according to a selected criterion of evaluation).

Of no lesser importance is the introduction of a system of progressive technical and economic norms and fixed standards, which constitute a complex of scientifically substantiated labor, material and financial norms and fixed standards as well as methods of their formation, replenishment and utilization in development of long-range and current plans. Such a system makes it possible to organize review and control of fulfillment of norms and fixed standards at all planning levels with the use of electronic computers [EVM]. The use in planning of scientifically substantiated technical and economic norms and fixed standards raises to a considerable extent the soundness and balance of plans and is an important means for raising the level of planning work.

One of the basic directions in improving planning is also ensuring the balance and soundness of plans, which must provide for balance of resources as well as for proportionate development in the activity of all economic links of transportation.

For developing a balanced plan it is necessary to determine the rational links, volumes and proportions of subdivisions and types of the sector's activity in accordance with national economic needs and work conditions of maritime transportation. In so doing the coordination of transportation resources (the carrying capacity of the fleet and traffic capacities of ports) with national economic and foreign trade needs in maritime shipments and cargo transshipment is implemented, the balance of the fleet by types of vessels is developed, the carrying capacity with consideration of the basic products list of cargo and the direction of shipments are calculated and the traffic capacity of ports is determined.

In view of the shortage of the fleet's carrying capacity for ensuring shipping of foreign trade cargo there is a clearly defined need for chartering foreign tonnage and for necessary financial funds for this purpose.

Balance of plans is a prerequisite for introducing an effective system of cost accounting stimulation of production and establishment of real cost accounting relations. Ensuring their balance requires, first of all, increasingly fuller and rational utilization of resources and material means.

For successful solution of social and economic problems, acceleration of scientific and technical progress and intensification of production an increasingly greater significance is being acquired by a system of correlated long-range and current (annual) plans. A leading role here must belong to a five-year plan with distribution of tasks by years. A five-year plan is the basis of the sector's economic activity.

Long-term economic relations must be formed and direct agreements with shippers for shipping cargo must be reached in accordance with the tasks for a five-year plan.

The drawing up of a five-year plan must be carried out with active participation of labor collectives and be based on progressive technical and economic norms and fixed standards for utilization of production capacities and expenditures of labor, fuel and energy resources and material and monetary assets. Five-year plan tasks for years of a five-year plan must be stable and balanced for resources and capital investments. Stable norms for withholdings to an economic incentives fund must be also defined in a five-year plan by years of a five-year plan.

In connection with strengthening the role of a five-year plan, the practice of annual planning is also being changed. Annual plans must be developed on the basis of economic norms and five-year plan tasks for a given year and provide for their essential clear definition and also for implementation of economic and organizational measures which ensure fulfillment of five-year plan tasks. Strengthening the role of five-year plans is one of the basic directions aimed at raising the level of planning work.

During the past few years, the party and government have adopted some documents which define fundamental directions in further perfecting of the planning system and improving the economic mechanism and forms and methods of supervision.

The resolution of the CPSU Central Committee and the USSR Council of Ministers "On Improving Planning, Organization of Shipping of National Economic Cargo and Passengers and Strengthening Influence of the Economic Mechanism on Raising Work Efficiency of Transportation Enterprises and Organizations" defines the most important task of ministries, departments, enterprises and organizations--complete and timely satisfaction of requirements of the national economy and population in shipping cargo and passengers with least expenditures. The USSR Gosplan, the USSR Gossnab, the USSR State Committee for Science and Technology, transportation and other interested ministries and departments of the USSR and councils of ministers of union republics were instructed that in working out plans for developing transportation they ensure comprehensive planning of shipping, balance the needs of the national economy and population in shipping and developing carrying capacities of all types of transportation, establishment of rational economic relations, correct distribution of shipments among types of transportation and economically substantiated development of cargo shipping in mixed shipments, determination of optimum correlations in the development of individual types of transportation and broad introduction of scientific and technical progress achievements in all types of transportation.

The resolution points to the necessity of improving the operational activity of transportation enterprises and organizations, effective utilization of fixed capital and material, labor and financial resources, economical expenditure of fuel, electric energy and materials and elimination of losses and unproductive expenditures.

The system of measures provided by this resolution is aimed at improving long-range and current planning, perfecting cost accounting on the basis of five-year plan tasks and long-term economic norms, raising the level of planning and financial work and strengthening the influence of economic levers and incentives for achieving high final work results of transportation enterprises and organizations.

For successful realization of the aforementioned resolution of the CPSU Central Committee and the USSR Council of Ministers in maritime transportation of great significance is the rallying of labor collectives of enterprises in revealing and using production reserves, raising work efficiency of the fleet, ports and other enterprises of the sector, improving analytical work, introducing into the practice of planning and appraising the activity of enterprises of economic indicators that stimulate the growth of final activity results of enterprises and raising professional knowledge of workers in operational, planning and financial services.

The planning system, which is defined by this resolution, will be introduced in full scope at transportation enterprises as of 1 January 1986. At the present time, necessary preparatory work is being conducted so that the plan for social and economic development of transportation enterprises for 1986-90 will be compiled according to forms and indicators that are being introduced by this resolution.

Forming the basis of preparatory work is working out methodical provisions and normative documents, carrying out a complex of measures of an organizational order as well as measures for raising economic and financial work at enterprises and strengthening labor discipline and cost accounting. All of these measures must be conducted with broad participation of labor collectives. Preparatory work conducted at MMF enterprises must provide for raising fixed capital utilization efficiency as well as for prompt discovery and realization of superfluous and insufficiently used funds; intensifying the work of the fleet, mainly by means of more efficient vessel traffic and reduction of layover time; improving the use of container park; intensifying the work of transshipment complexes in ports by organizing the work of transportation centers more efficiently; accelerating settlements and reducing funds, which are necessary for fulfillment; and making control more stricter. All of this, in the final analysis, should ensure a level of economic supervision which is necessary for transition to a more perfect form of planning.

Consistent implementation at maritime transportation enterprises of measures aimed at raising the level of planning and economic work and limited combination of moral and material incentives will be a powerful lever in raising work efficiency of maritime transportation, growth of monetary receipts, improvement in the utilization of production capital and manpower resources and further strengthening of cost accounting.

Drawing into production on a large scale of costly and technically perfect fixed capital, such as modern vessels and specialized transshipment complexes in ports, requires constant attention to improving planning, raising scientific substantion and balance of plans, the role of economic analysis and calculations in planning and strict adherence to planning and financial discipline at all levels of planning and production.

Improving planning and economic supervision presupposes not only a change in the composition of plan indicators and conditions for appraising the work results of enterprises, but mainly raising the level of economics and carefully thought out economical expenditure of material, energy, manpower and financial resources in order to substantially increase the output of the end product per unit of expended funds. In this connection it is necessary to considerably raise the substantiation of fixed capital utilization norms and fixed standards, the expenditure of fuel, energy, material and manpower resources and ensure strict adherence to these norms and fixed standards at every enterprise of the sector.

For raising intensity in the utilization of the fleet, ports and ship repair plants, it is necessary to devote particular attention to questions of improving operational planning and management of the transportation process and to broaden adoption of optimizing decisions on the basis of automated control systems and computing technology. Ensuring a high level of fleet utilization remains an important problem.

In view of the slowed-down replenishment of the fleet and its relative aging, the questions of vessel modernization and competent technical exploitation

acquire a special significance. Conducting prompt quality repairs with modernization elements prepared in advance must become the basic factor in maintaining the fleet at a contemporary level.

At the present time, vigorous work is underway at maritime transportion enterprises in working out tasks of the 12th Five-Year Plan. The basic task of labor collectives in working out and discussing plans for social and economic development of enterprises for the new five-year plan consists in analyzing the work of enterprises attentively and deeply, uncovering reserves and unused opportunities and outlining ways for their realization. In substantiating plans for social and economic development for 1986-90, it is necessary to develop measures at every enterprise for accelerating scientific and technical progress and introducing in production of leading scientific and technical achievements and on their basis provide for work intensification at enterprises and for raising efficiency in utilization of the fleet's fixed capital, ports, ship repair plants and other enterprises of the sector.

Under current conditions, when the pace of development and replenishment of the fleet is slowing down and the need in maritime shipping is growing, ensuring stable and highly efficient work of all transportation links, competently and precisely planned work of the fleet and coordinated smooth work of transportation centers is of special significance. Ensuring coordinated work of the fleet and ports will make it possible to intensify utilization of fixed capital of maritime transportation to a considerable degree. This task is one of the dominant ones in the sector's economy in the current period as well as in the future.

During the 11th Five-Year Plan, leading collectives of ships, ports, ship repair plants and other enterprises have accumulated extensive work experience. The results achieved by them should be made the norm of work of all collectives. The key to successful work of the entire sector is in this.

9817
CSO: 1829/49

CHIEF ON SOVIET TANKER FLEET DEVELOPMENT

Moscow MORSKOY FLOT in Russian No 9, Sep 84 pp 25-30

[Article by V. Pavlenko, vice president of the Soviet Shipowners Association and chief of the Novorossiysk Shipping Company: "The Soviet Tanker Fleet"]

[Excerpts] Rapid development of export and coastal liquid cargo shipments and the corresponding growth of tanker tonnage made it necessary initially to organize specialized administrations, and then independent oil shipping companies. Thus in 1964, the Tanker Fleet Administration was organized in Novorossiysk as a component of the Black Sea Shipping Company, and in 1967 independent oil shipping companies were born in Novorossiysk (the Novorossiysk company) and in Batumi (the Georgian company). A similar oil shipping company was also formed in 1971 in the Far East, in Nakhodka (the Primorskaya company). A large tanker fleet is also concentrated in the composition of the Caspian and Latvian shipping companies.

The number of the country's tanker fleet vessels increased from five-year plan to five-year plan, their carrying capacity grew and the geography of shipments and the range of transported cargo expanded. Tankers acquired "related professions," taking on into their cargo tanks, in addition to oil and petroleum products, grain, raw sugar, fish meal, molasses, vegetable oil and other products. By 1980, the USSR tanker fleet already consisted of 475 vessels with an overall deadweight of 7.3 million t (including 5.5 million t concentrated in the Novorossiysk Shipping Company). If in the quantitative respect the tanker fleet accounts for only 6.3 percent of the overall number of the Soviet merchant fleet, then for the overall deadweight of vessels it accounts for more than 28 percent!

Shipping of cargo in tankers plays an enormous role in the country's foreign trade balance. Suffice it to say that Soviet tankers transported 80.4 million t of foreign trade cargo in 1980. This is more than half of all domestic export-import shipments and nearly 5 percent of the world volume of oil shipments for the same year.

Tankers and bulk tankers flying the flag of the USSR call at nearly 500 ports in more than 80 countries of the world annually, fulfilling export-import and [word illegible] shipments. Moreover, tanker seamen also handle with distinction the responsible tasks for delivery of national economic cargo to regions of the Arctic and the Antarctic.

For the Novorossiysk, Georgian, Latvian, Primorye and Caspian shipping companies, which carry out the basic liquid cargo shipments, the past few years were significant owing to the replenishment of the fleet. Replacing the obsolete vessels of the type such as "Kazbek," "Beijing," "Aksay," "Oleg Koshevoy," "Azerbaijan," "Inzhener Pustoshkin" and others are modern automated large and medium capacity vessels, which conform to the requirements of conventions on environmental protection, of the type such as "Velikiy Oktyabr'," "Krym," "Pobeda," "Novorossiysk," "Boris Butoma," "Komandarm Fed'ko," "Drogobych," "Pablo Neruda," "Sukhumi," "Altay" and others.

Considerable growth of economic efficiency in the work of the fleet has been achieved everywhere as a result of improved utilization of its carrying capacity, extension of the operational period and cycles between repairs of vessels, improvement in fleet management on the basis of NGRF [continuous schedule of fleet operations], further mobilization of internal reserves and introduction of leading experience. Significant for this stage was the active struggle for economizing fuel and energy resources, introduction in the fleet of new equipment and leading technology, upsurge of the efficiency movement, intensification of the struggle for accident-free work of the fleet, safety of cargo, strengthening labor and production discipline, growth of personnel qualification and improvement of their ideological and political education.

Crews of tankers have all joined together the all-union comprehensive socialist competition under the motto "For High Work Quality at Every Work Place." The practice of assigning tankers to definite routes and shipping cargo in successive voyages, which ensures considerable economy of operational expenditures, is gaining an increasingly greater recognition and dissemination.

Being used on an increasingly broader scale on vessels are such leading and efficient initiatives as washing tanks with crude oil, operation of vessels in economical speed conditions, utilization and employment of petroleum waste products as fuel and secondary heat sources from various ship systems and use of homogenized fuel and aqueous emulsions instead of traditional kinds of fuel. During the past 3 years, tanker seamen of the country were able to obtain approximately R85 million in above-plan profits and save 180,000 t of fuel, more than 100 t of lubricating oil, nearly 40 million kilowatt-hours of electric energy, hundreds of tons of ferrous and nonferrous metals and tens of thousands of gigacalories of thermal energy.

Our Novorossiysk Shipping Company is faced with conducting considerable work aimed at further intensification of production. The annual plan for economic and social development provides for increasing net receipts and profits from basic operational activity. It is necessary to ensure fulfillment of these tasks in spite of objective tonnage reduction (in connection with scrapping vessels before planned). Clearly, the outlined increase must be achieved as a result of raising the fleet's work efficiency, increasing labor productivity, improving forms of its organization and stimulation and all possible economizing of material, financial, energy and manpower resources.

Socialist pledges envisage, in particular, to ensure the length of average annual operational period of tankers of at least 301.6 days and to reduce layovers in Soviet ports by 10 percent.

By the end of the 11th Five-Year Plan, cargo turnover will increase by 12 percent and will total more than 800 billion ton-miles. As we can see, the tasks are highly responsible ones.

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OFFICIAL ON 'VOLGOTANKER' SHIPPING COMPANY PROGRESS

Moscow VODNYY TRANSPORT in Russian 1 Sep 84 p 2

/Article by N. Strokin, first deputy chief of the Volgotanker Shipping Company: "How To Equalize an Inequality"/

/Text/ I remember how several decades ago our Volgotanker Shipping Company began to renovate itself intensively. We replaced petroleum-carrying barges and steamships with tankers. The distinctive traits of the new vessels were increased cargo capacity, outstanding operational characteristics, and a power-plant capacity which was large for those times. Then it seemed to everyone without exception that scientific and technical progress on the country's petroleum-carrying river fleet consisted precisely in such vessels, which were sufficiently mobile and had the possibility of performing loading and unloading operations without any auxiliary means.

And only now, a long time later, has it become clear that a serious miscalculation was allowed to occur in the prospective program for renovating the fleet. The shadowy factors did not come to light at once, not all of a sudden, but rather accumulated over the course of several five-year plans. Up-to-date tankers and petroleum-carrying vessels of the river-sea class came to replace the obsolete ships. The operating limits of this steamship line have been expanded. Today our petroleum-carrying vessels sail to dozens of ports on the Baltic, White, Caspian, Black, and Mediterranean Seas. Approximately 80 percent of the shipping company's entire cargo turnover is handled just by the self-powered fleet.

It would seem that there should be no cause for concern: petroleum cargoes have begun to be hauled both farther and faster. But quantitative indicators in time grew into qualitative ones. And we proved to be under the influence of a deceptive state of well-being. Even an extremely superficial analysis shows that during the past five-year plan alone self-powered tonnage increased by 27.8 percent, while with regard to the non-self-powered fleet, cargo-carrying capacity declined by 26 percent. If in 1970 the ratio between the tanker fleet and the barge fleet amounted to 34 percent and 66 percent respectively, already by 1980 this indicator had changed in the other direction, and the proportion of self-powered tonnage had reached almost 62 percent. Could it be that such a change was brought about by production needs or that structure of the cargo flows which took shape? But precisely where, on what routes, would it be more feasible, with the best yield on investment, to utilize the tanker or the non-self-powered fleet?

It is not difficult to answer these questions. In my opinion, on the inland waterways it is preferable to operate the petroleum-carrying barge-trains, while it is best to use the tankers and crude-oil carriers on the mixed river-sea hauls, as well as for delivering petroleum products to small-scale bases. But this is merely wishful thinking. The fact is that the tanker fleet still completely dominates the entire length of the Volga-Kama Basin.

Passing through its rivers at the present time are the hauls of more than 80 percent of all the petroleum cargoes pre-planned for the shipping company. Most of the cargo hauls on the Volga, Kama, and on the White Sea are marked by their stability, and, according to preliminary forecasts, no substantial changes at all will occur here.

By the end of the 1980's it is anticipated that there will be an increase in the volumes of petroleum products on this route by 1.5 million tons. It is planned to achieve this increase by means of shipping 2 million tons of fuel oil from Gorkiy. But this future cargo flow will become a reality only with the beginning of operation of the fuel-oil pipeline from the Novogor'kovskiy Oil Refinery to the petroleum base by the river.

But, meanwhile, the deadlines for building this important facility for our steamship line are not being met. When this new main pipeline is put into operation, our operating personnel will have new possibilities for strengthening the Gorkiy --Yaroslavl route with several large-cargo barge trains. But then by how much will the gap between the tanker fleet and the non-self-powered fleet be narrowed, and will an optimal ratio between them be achieved during the 12th Five-Year Plan?

My doubts have been caused by several circumstances. The time will soon come when we will have to replace that portion of the tanker fleet used in combined hauls because the tankers of the 1577 design type can operate at sea only with considerable limitations as regards the wave regime and the time periods of navigation. Their hulls quickly lose the necessary strength because of corrosion wear, and for this reason the monitoring organizations usually impose a "veto" on such vessels going out into the maritime basins.

Such tankers will subsequently be used, as a rule, only on inland waterways. It is anticipated that by 1985 some 80 units of this fleet without future prospects will be shifted to operations within the limits of the Volga and the Kama. Hence the disproportion could be maintained as a constant over the course of many years. Furthermore, lowering of the proportion of non-self-powered tonnage within the over-all balance of the fleet has led not only to an increase in the production cost of hauls but also to a reduction in the amount of traction: during the past five-year plan the number of diesel-powered pusher-tugs declined by more than 20 percent. And in order to put a stop to this negative process, we must seek out more effective ways to increase labor productivity on hauls, as well as reducing expenditures.

It is my profound conviction that one of the optimal directions is the prospect of utilizing on the inland waterways of the Volga-Kama Basin trains consisting of two R-167 barges, with diesel ships having a capacity of at least 1500 horsepower.

Their operation, as compared with tankers, on the routes of the inland waterways will allow us not only to reduce the production costs of hauls by 10--20 percent but also to reduce operational expenditures by 25--30 percent.

But how will the situation shape up at the end of the 11th Five-Year Plan? For this shipping company the optimal variant of the ratio between the tanker fleet and the non-self-powered fleet is as follows: tankers--53 percent, barges--47 percent; on the inland waterway routes it should not exceed 35 percent and 65 percent respectively. With such an arrangement of the fleet a high degree of effectiveness can be guaranteed for the transport process. But at the given stage the picture of this ratio is far from ideal. Just on the inland waterway routes the barge trains are hauling only 27 percent of the total volume of petroleum cargoes.

But just how should we draw near the intended goal? Because, of course, then the steamship line will be confronted with the task of obtaining from the Shipyard imeni Third International 90 barges of the R-167 design and at least 40 diesel ships with a capacity of 1500 horsepower from the shipbuilding enterprises. At the same time about 50 tankers must be taken out of operation. In order to carry out such a program, the Shipyard imeni Third International would be required to stop the construction of dry-cargo barge trains, and the enterprise's group would have to fully convert to turning out petroleum-carrying barges. But prior to the end of the current five-year plan this enterprise plans to launch a total of only two barges of the P-167 design.

At such a pace the evening out of this disproportion could stretch out for several more five-year plans.

"It may be," said the general secretary of the CPSU Central Committee, Comrade K. U. Chernenko, at the February Plenum of the Party Central Committee, "that it is still too early to speak in detail about our tomorrow, the 12th Five-Year Plan, but the main problems, the principal directions of the upcoming work are already to be seen now."

I consider that the decisive shift must take place during the next five-year plan. It is necessary so that the Volga petroleum "conveyor" can operate smoothly, profitably, and with a high degree of economic effectiveness.

2384
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ORGANIZATION, OPERATION OF MARITIME FLEET MINISTRY MANAGEMENT

Moscow MORSKOY FLOT in Russian No 4, Apr 84 pp 18-21

[Article by L. Paladich, chief of the MMF [Ministry of the Maritime Fleet], Administration of Affairs: "Organizing Executive Control in the Ministry"]

[Text] The transition of the national economy, primarily to an intensive path of development, and the rise in production efficiency are indissolubly combined with an improvement in the economic mechanism and carrying it out in accordance with today's requirements for the level of administration for the economic system.

It was noted at the December (1983) CPSU Central Committee Plenum that only a comprehensive, interrelated examination of the problems of improving the administrative system can solve the task of fullest utilization of the advantages inherent in the socialist method of production. It is precisely because of this that systematic work on improving the planning and organization of the transport process, bettering interrelations with associated workers within the framework of the transport complex and heightening executive discipline in all the units of the sector have a tremendous influence on the end results of its activity. Without exaggerating, it can be said that an effective system of monitoring performance, supported by a thorough analysis of administration organization, can in many ways ensure the abovementioned complexity.

From the first steps of the young Soviet State, V.I. Lenin attributed the greatest importance to monitoring and testing performance as an indispensible condition of the successful realization and carrying out of the decisions of the party and the government, considering the monitoring as the effective means for successful fulfillment of the tasks outlined. Vladimir Il'ich personally formulated many of the problems of organizing the monitoring, which today too constitute an extremely important part of the Marxist-Leninist doctrine on the socialist state, and took a direct part in preparing the documentation for organizing the activity of the monitoring organs.

V.I. Lenin felt that monitoring should fulfill the following functions.

In the first place, discover on time and promptly eliminate the shortcomings, but at the same time, "... not only and even not so much 'catch' and 'expose' as to know how to correct"; this is the way to monitor so that "... in every

way possible and in all possible respects, one may show and render assistance to the matter, even though it be in small measure, but be practicable."

In the second place, further the realization of the party and government directives and give an objective evaluation of the results obtained in the course of fulfilling the resolutions, from the standpoint of accordance with their deadlines and purposeful aims and assignments.

In the third place, to reveal more fully the available potentials and reserves, to reveal the new, better for work, and thus to help detect tendencies for the future and to work out additional measures for a successful solution to the problems as a whole.

An extremely important task in monitoring performance is a thorough and scrupulous verification of the actual state of affairs in all the units of the public system, attaining precise fulfillment of the resolutions adopted and coordination of the work of all the units in the system.

From this standpoint, monitoring performance is a system for verifying the correspondence of the results of the activity of state, economic and party organs to the socio-economic and political goals placed before them.

Vladimir Il'ich regarded monitoring as an active element in the implementation of the tasks set, emerging together with the organization of the performance and ensuring the unity of word and deed. In other words, monitoring the performance of each assignment should terminate in the formulation of specific proposals, blending essentially with the organization of the performance, since monitoring is not a sporadic measure but a constant analytical process. It does not simply take part in all stages of realizing the administrative resolutions and ensure feedback and give information to the administrative organ on the course of putting into effect the resolutions, but also lays the basis for new administrative resolutions. The latter are particularly important for dialectic understanding of the place and role of monitoring in administration.

A great role in performance organization belongs to the directors. V.I. Lenin emphasized that the main work of the directors was, "...or which they are particularly responsible and to which everything else should be subordinated lies in verifying the actual performance...

Everything further is detailization of this basic task or a specific addition to it."

The personal responsibility of the directors for the state of monitoring performance was pointed out in the resolutions of the 26th CPSU Congress and in the decree of the CPSU Central Committee "On Further Improvement in Monitoring and Verifying Performance in the Light of the Resolutions of the 26th CPSU Congress," which again confirmed the indisputable truth of Lenin's requirement: "Monitoring and verifying performance should be the most important integral part of the daily organizational work of any unit in the party and state system, of each...soviet and economic operations director..."

Correctly placed monitoring contributes to fostering among the workers a sense of discipline, high responsibility, exactingness, initiative and a creative approach to the business entrusted to them, i.e., those qualities which ensure successful fulfillment of the tasks assigned them.

Monitoring acquires particular importance under the conditions of developed socialism. A thorough analysis of the state of monitoring and verifying performance, the task and the way to its further improvement is given in the resolutions of the CPSU Central Committee party congresses and plenums. In the last decade a number of CPSU Central Committee decrees were adopted which were directed toward improving monitoring the verification of performance and work with the letters and proposals of the workers.

The November (1982) CPSU Central Committee Plenum pointed out the need for "...making it a rule that each new resolution for one and the same problem be taken only when the past resolutions were fulfilled or some new circumstance arose."

Performance monitoring should actively contribute to "...words never being separated from the deed, but the essence of the deed not be substituted for by form. This is one of the most important potentials for improving our socialist democracy in all units of state and public life...."

The Collegium

The important role of the Collegium of ministries and their responsibility for the state of performance discipline was emphasized in the decree of the CPSU Central Committee (1980) "On the State of Monitoring and Verifying Performance in the USSR Ministry of Petroleum Refining and Petrochemical Industry."

The 26th CPSU Congress directed attention to the need for raising the level of this work as a highly important component in the organizational work of operations directors.

"Having adopted the resolution," it was noted in the Review Report of the CPSU Central Committee 26th Congress, "its fulfillment must be unswervingly attained in the established period. Intensification of monitoring must also help this. Monitoring must also be implemented sytematically and efficiently."

The Collegium of the MMF [Ministry of the Maritime Fleet] regularly, using the examples of organization of executing individual orders, Collegium resolutions and commissions, examines problems of the state of executive discipline in the subdivisions of the central system and shipping companies.

Monitoring the course of carrying out the state plan for economic and social development of the sector constitutes a large part of the problems reviewed by the Collegium.

The MMF Collegium also regularly examines problems of work with the letters and requests of workers, the course of solving problems raised in the sectorial

and national press. For example, in 1983 over 55 percent of all the problems discussed at the Collegium pertained to monitoring of performance.

Inspectorate at the Ministry

The responsibility for organizing monitoring of the sector's performance and work with letters from workers has been placed on the inspectorate at the ministry, which includes the Administration of Affairs.

The basic task of the inspectorate is ensuring efficient monitoring of full, timely and high-quality execution in the ministry of the decisions of the party, government, ministry and the Collegium.

The main form of the inspectorate's implementation of monitoring performance is carrying out analytical tests of organizing the execution of orders and individual commissions in the central organization and at the enterprises.

Constant participation of the inspectorate in the Collegium's activity is carried out through correlation of the plans for its work with the problems included in the Collegium's work plans.

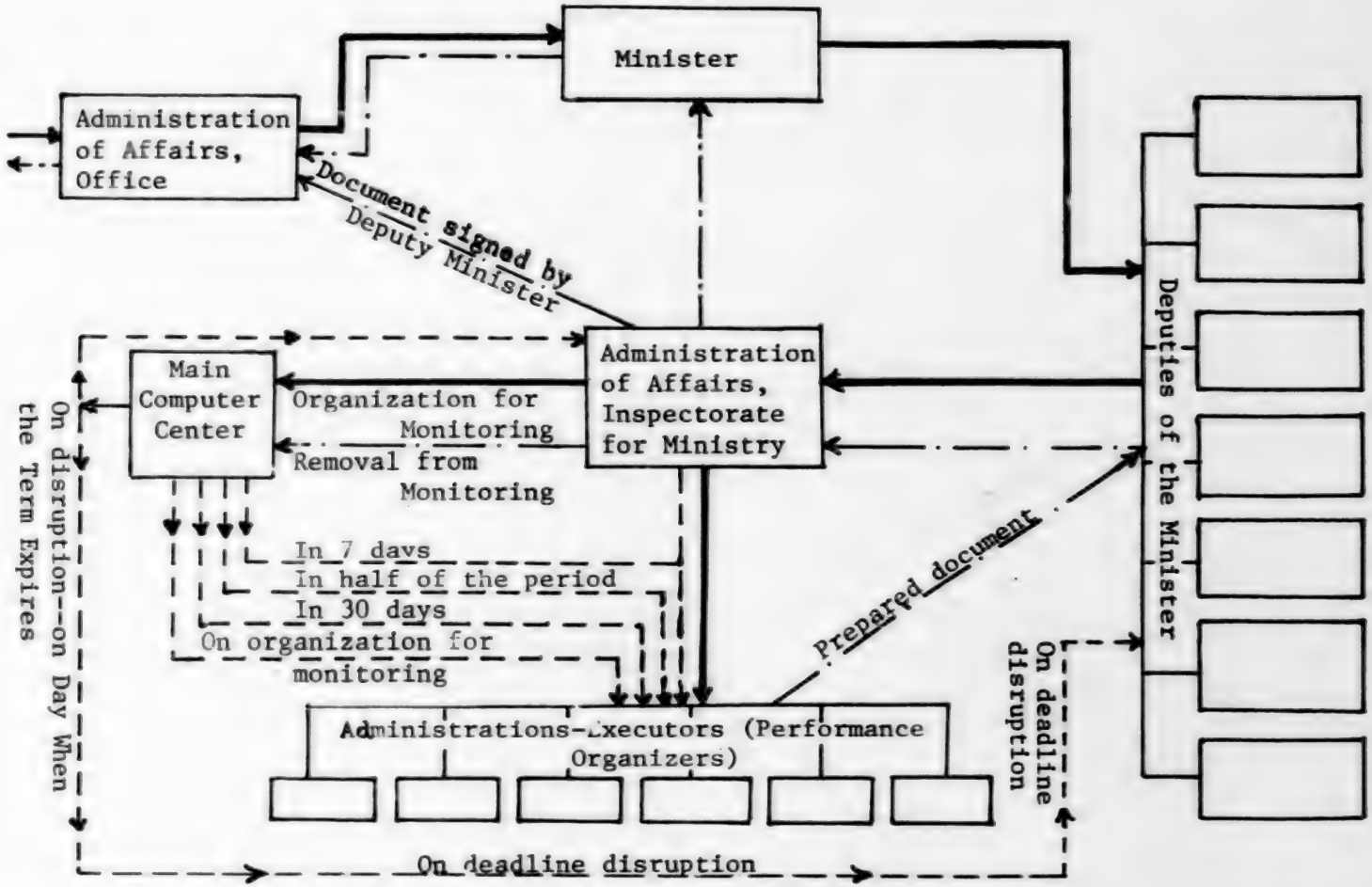
Also of great importance is the analysis, constantly carried out, of the decisions of the councils of the shipping companies. For this purpose, the inspectorate includes the secretariat of the Collegium, which has noticeably contributed to raising the quality of preparing the materials presented to the Collegium, and the soundness and comprehensiveness of the decisions proposed. Therefore, a principle has been put into practice in the work of the Collegium, through the inspectorate--each decision of the Collegium takes into consideration the results of analyzing the fulfillment of preceding decisions with respect to the given question.

One other fact of fulfillment or nonfulfillment of a commission is not yet satisfactory--in each case a thorough analysis of the precise organizational aspect of the problem is made: how fulfillment of the commission was organized, what measures were taken, whether the fulfillment is the result of a well-checked-out execution mechanism or whether it is the result of hasty actions in the last days before expiration of the established deadline.

Councils of the Shipping Companies

Today the activity of the councils of the shipping companies is determined by the Standard Statute on the Council of a Marine Shipping Company, which stipulates that one of the main tasks of the council is to render effective assistance to the chief of the shipping company in implementing efficient monitoring of the fulfillment in the shipping company of the decisions of the party and government, ministry and of its own decisions.

Diagram of Performance Monitoring Organization at the Ministry of the Maritime Fleet



To solve the basic problems, the shipping company council examines by monitoring at its sessions the course of fulfillment of the plans for economic and social development of the shipping company, the routine activity of the subdivisions, the state of work with letters and applications from the workers in the subdivisions and at the enterprises of the shipping company, as well as the course and results of the decision of individual proposals and complaints of the workers and statements of the press.

It should be emphasized that the council of the shipping company examines all the above and other problems in the monitoring procedure, without substituting for the manager of the subdivisions and enterprises of the shipping company, and takes measures so they utilize in full volume the rights granted them for independent and prompt fulfillment of the assignments of the plan for socio-economic development of the shipping company in the collectives headed by them.

The Standard Statute imposes on the members of the shipping company councils the duty, when visiting their enterprises, of checking the state of organization of the execution of the party's and government's decisions, orders in accordance with the MMF and shipping company, decisions of the Collegium of the MMF and council of the shipping company and of rendering them assistance for efficient organization of the execution and of informing the council of the results of the check and their conclusions on the state of organizational work and discipline for the execution.

Monitoring-Inspection Departments of Shipping Companies

Organizing monitoring of the execution in major shipping companies is entrusted to the monitoring-inspection departments, and in the others--to the assistants of the shipping company chiefs.

In the Standard Statute on the Monitoring-Inspection Department, implementation and methodical direction of the organization monitoring the execution and work with letters from the workers at the shipping company and at the enterprises subordinate to it is regarded as one of its basic functions.

The Monitoring-Inspection Department implements direct monitoring of the course of putting into practice at the shipping company the decisions of the party and the government, the MMF and management of the shipping company; prepares conclusions according to the material presented for review by the council of the shipping company (completeness of fulfilling all the decisions adopted for the given question, conformity to plan of organizing their execution; organizing the role of the services and departments of the shipping company); execution at the shipping company, regularly informs the shipping company management on the course of fulfillment of the most important assignments at the enterprises and the state of executive discipline; presents proposals for improvement of this work; monitors adherence to the requirements established by law when examining the applications of the workers at the enterprises of the shipping company.

Organizing Monitoring of Performance

Taken for monitoring in the ministry are the decrees and instructions of the USSR Council of Ministers and the resolutions of the CPSU Central Committee on national economic problems, the instructions of the directive organs for the appropriate directions, orders of the ministry, instructions of the ministry and deputies of the ministry for specific problems of the sector's production activity, for letters and applications of the workers and for press releases and decisions of the Collegium.

Strictly speaking, from the first three types of documents enumerated, not the documents themselves are to be monitored, but the administrative decisions taken by the management of the ministery for execution of these documents and directed toward putting them into practice under the sector's specific conditions.

In taking into consideration the specific deadlines for the commissions, the monitoring is carried out in two ways: commissions with an execution deadline up to 10 days are monitored with the aid of monitoring cards; assignments with longer deadlines, however, are fed to an electronic computer for monitoring in accordance with the ASU [automatic control system] "Performance Monitoring."

Before presentation for signature to the management of the ministry, drafts of the orders and decisions of the Collegium are examined by the inspectorate at the ministry, so that they may be verified in the process of execution. After being signed by the MMF management, the monitor copy of the document, with notes from the inspectorate (which must precisely be the one to take on the monitoring) is turned over immediately to introduce into the electronic computer.

When the commission requires the participation of several subdivisions having an identical legal status and administratively independent from each other, the assignment determines the main subdivision (with respect to the meaning and volume of assignment fulfillment), which is also indicated as the first when the executors are listed. Therefore, the first of the executors listed in the commission is responsible for its fulfillment: in this case the administrative document grants it the temporary right to manage the work of the rest of the executors to fulfill the given commission. At the same time it imposes on it the responsibility to ensure prompt and complete fulfillment of the assignment, as well as the corresponding report to the management (if this is specified in the commission) and promptly taking the assignment away from monitoring.

On Mondays the Main Computer Center of the MMF sends to each subdivision signal information on all the assignments posed for electronic computer control, in accordance with which a given subdivision is determined as the responsible executor.

On the same day, the subdivision-executors, inspectorate at the ministry and assistants are sent, by the deputy minister (for the subdivisions being treated) precautionary information on the assignments being monitored, the execution deadline of which expires in the course of the following week.

For assignments with an execution deadline of over three months, the precautionary information is sent to the executors a month before the deadline elapses.

In the process of fulfilling the assignment, additional circumstances often arise which may substantially affect the initially posed task, in connection with which the need appears to change the deadline for fulfillment of the assignment as a whole or part of it. The established system for monitoring execution of the assignment in this case obliges the director to offer promptly proposals for an efficient change in the volume or deadlines for execution. Slow communication on the unsatisfactory course of fulfilling the assignment is regarded as a violation of execution discipline.

The work of the inspectorate at the ministry with regard to monitoring performance discipline includes a spot check and analysis of the execution organization by the subdivision of 5-10 documents; determination of the efficiency of the practical work established in a specific subdivision for adopting administrative decisions; evaluation of the organizing role of the subdivision in mobilizing and practical direction by the enterprises when fulfilling specific orders and decisions of the board and the management of the ministry; revealing through individual facts the shortcomings in the administration and discussion of the results of the analysis in conjunction with the directors of the subdivision and working out specific recommendations to improve the system of organization and monitoring of the performance; rendering methodological assistance to the subdivisions of the central system and the shipping companies in organizing the formulation of the performance monitoring; dissemination of positive experience; preparation of the proposals for the management of the ministry to increase the efficiency of the administrative decisions.

In this list of tasks, all the elements are important. But in the final analysis, one thing remains the principal one--convincing conclusions and substantiated proposals, for otherwise the check turns into a formal and bureaucratic measure. "One must be able not only to lash and criticize," said V.I. Lenin, "but to show without fail how to correct the matter. This is a very difficult art."

It goes without saying that to fulfill this condition there must be experienced workers, with a sufficient knowledge of the sector, capable of taking an analytic approach to the matter and critically evaluating the action of the directors of the enterprises and institutions in consideration of the tasks facing the sector as a whole.

In consideration of these requirements, at the Ministry of the Maritime Fleet the monitoring is carried out by assistants from the ministry and the main inspectors included in the inspectorate at the ministry, combined into an analysis group. Together with the group of operations monitoring and the secretariat of the Collegium they ensure efficient, comprehensive monitoring of the performance.

The state plan for the economic and social development of the sector is the determining one in its activity. All the rest of the documents and decisions are to a greater or lesser extent produced from it, ensuring its fulfillment.

At present the Administration of Affairs, Glavflot [Shipping and Operation of the Fleet and Ports MA] and the Planning and Currency and Finance Administration are working out methodology to organize the preparation of this plan, as well as systematic and comprehensive monitoring of the course of its fulfillment over the year for both the shipping companies and the directions. The social directedness of the plan is being intensified.

Monitoring the execution of the assignments of the state plan specifies a systematic analysis of fulfillment of the assignments in accordance with such important economic indicators as labor productivity, production cost and profit; the outstripping growth of the final results as compared with the increase in input; wide-scale introduction of the achievements of science, technology and the advanced experience of the brigade form of organizing labor.

For 1985 the ministry outlined the introduction of a new subsystem of automated control of performance and documentation (AKID). Its advantages consist of the following.

Recording on an electronic computer (with control through a video-terminal) of all the incoming documents is done automatically, entering into the electronic computer all the decisions adopted according to a specific document is carried out with the aid of peripheral equipment; the electronic computer correlates all the initial indications and decisions with specific commissions from the higher organs (the machine accepts for recording any document only after a reply to the question: the specific instruction is given to fulfill which specific document?)

The AKID subsystem makes it possible to call up to the video-terminal the production executive decisions for any document and instructions, as well as making possible efficient intervention in the course of execution of the higher levels with respect to the lower (ministry management--administration/association--functional divisions--shipping companies). In time it is intended to include in this system ports, plants, scientific-research and planning-design organizations.

Use of a modern automated system to monitor performance will undoubtedly have a positive effect on further increase in the efficiency of the sector's activity.

12151
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JAPANESE-BUILT BULK CARRIER 'KAPITAN TRUBKIN' PROFILED

Moscow MORSKOY FLOT in Russian No 9, Sep 84 pp 41-43

[Article by Candidate of Technical Sciences Yu. Shved, chief of the technical department of the Black Sea Shipping Company: "Fleet Technology: The bulk carrier 'Kapitan Trubkin'"]

[Text] In 1983 the bulk carrier "Kapitan Trubkin" was added to the Black Sea Shipping Company's fleet. The vessel, built in Japan at the end of 1981, is a Lloyd's class LRS + 100A carrier, meaning this bulk carrier can also transport heavy cargo. The vessel complies with basic national and international regulations.

At a draft of 10 meters the vessel has a 14.7 knot operational speed.

The ship has five cargo holds. The engine room and superstructure are located aft. The vessel has a bulbar bow and and transom stern above the waterline. Hold capacity when carrying grain is 34,335 cubic meters with trim and 32,717 cubic meters without trim. Stacking support stakes are fitted along its sides for timber hauling. Timber can be carried in the holds and on the deck, even on the hatch covers. Its total capacity is 45,315 cubic meters of boards or 42,750 cubic meters of logs, with an upper deck capacity (including hatch covers) of 11,445 cubic meters and 8,880 cubic meters respectively. The holds are opened by a MacGregor chain-type system.

Vessel ballast includes 1,258.4 tons in the forepeak, 176.2 tons in the afterpeak, 3611.8 tons in three pairs of side tanks located in the bilges and 3,500.4 tons in three pairs of underdeck side tanks. While underway, 6089.8 tons of ballast can be taken into hold No 3 to improve vessel handling qualities. The total amount of ballast that can be taken on is 14,636.6 tons.

The fuel tanks have a capacity of 1,595.8 cubic meters of heavy fuel and 187 cubic meters of light fuel. For the diesel generators there are two reserve oil tanks with a capacity of 2 cubic meters each and a sump holding 1 cubic meter. Total fresh water capacity is 281.1 cubic meters.

The anchor chain mechanism consists of hydraulic capstans with a traction rating of 260 kN at a hauling speed of 9 m/min. and a windlass rated at 100 kN with a hawser takeup speed of 15 m/min.

Basic vessel characteristics

Length:		
Overall	170.6	meters
Between perpendiculars	162.0	meters
Beam	24.6	meters
Side height	14.20	meters
Summer draft	10.06	meters
Displacement at summer draft	33,415	tons
Dead weight at summer draft	27,082	tons
Gross tonnage	14,558	registered tons

There are two primary and one reserve anchors weighing 6 tons each. The anchor chain is 577 meters in length and has a diameter of 60 mm. There is a device to release the anchor chain end link.

There are two lifeboats, with a capacity of 45 persons each. The starboard boat is fitted with an engine while the port boat is propelled by oars. Davits are of the gravity type with lifeboat winches powered by a portable pneumatic motor.

The lifeboats are equipped with a winching mechanism. Two liferafts with a total capacity of 25 persons each and equipped with hydrostats are located on the boat deck. One portable raft (for 6 persons) without a hydrostat is located on the forecastle and is released manually.

The electrohydraulic steering mechanism produced by Japan's Kawasaki Heavy Industries has a 500 kN-m torque rating. The semicompensated rudder has a area of 25.8 square meters. A steering mechanism test showed that less than 28 seconds are required to go from 35 degrees left to 35 degrees right rudder at a 2/3 throttle rudder loading.

The four-bladed, 5150 mm diameter screw is made of nickel-aluminum bronze. The "keyless" screw is pressed onto the drive shaft. It can be removed hydraulically and its boss contains special oil cavities for this purpose. The screw weighs 10.2 tons. The driveshaft has a simplex end seal and shaft diameter at the rubber sealing rings is 500 mm.

Five hydraulic cranes mounted on special cylindrical columns located on the forecastle and between holds have a capacity of 25 and 12 tons at cargo lifting speeds of 19 and 38 m/min. respectively. The boom length is 22 m. Hatch covers are opened with these cranes.

The vessel's firefighting unit is a water system consisting of a main pump producing 180 cubic meters/hr at a head of 25 meters, a ballast/firefighting pumping producing 340 cubic meters/hr at a head of 20 meters, a diesel-powered emergency pump producing 40 cubic meters/hr at a head of 80 meters, 16 on-deck hydrants, six hydrants in the engine room and 21 hoses with nozzles.

The carbon dioxide extinguishing system consists of 104 cylinders for the cargo holds and 60 cylinders for the engine room. Carbon dioxide is provided in the central control station, the separation section and along the engine room decks to the primary and auxiliary engine extinguishers. There is a separate carbon dioxide extinguishing system in the paint locker.

A steam extinguishing system is fitted to a main engine opening located below the piston level. The cargo holds are equipped with a smoke detection system.

The main power plant consists of a Hitachi-Burmeister & Wein 8L 55 GF CA diesel engine developing maximum continuous power of 7.76 MW (10,550 HP) at 151 rpm and cruising power of 6.60 MW (8970 HP) at 143 rpm. It has a bore of 550 mm and a stroke of 1380 mm. There are two constant-pressure exhaust gas turbochargers. Two electric blowers are automatically engaged when turbocharger pressure drops below operating limits. The engine is a long-stroke unit and has hydraulically actuated exhaust valves. The engine is controlled from the central control station throttle or from the emergency control station. The engine has a crankcase oil vapor monitoring unit.

The vessel's electric plant contains three diesel generators. These engines are six cylinder, four stroke Daihatsu 6DSD-22 diesels developing 0.49 MW (670 HP) at 900 rpm. The Nishishiba Electric generators produce 450 W (60 Hz) at 900 rpm.

The combination Cochran-type boiler made by Japan's Nishida Marine Boiler firm produces 1400 kg/hr of steam at a pressure of 700 kPa.

All pumps servicing the power plant are of Japanese manufacture. Two heavy fuel separator pumps with a 3150 liter/hr output, a diesel fuel pump with a 2200 liter/hr output and two oil circulation pumps, each with an output of 2500 liters/hr, are produced by the Mitsubishi Company. The fuel supply system permits the use of 180 centistoke viscosity oil in the main engine.

Notable among the power plant's original equipment is the Atlas AFGV No 5 vacuum condensor made by Sasakura Engineering, the heat source for which is the main engine's cooling water. At an outboard water temperature of +30 degrees Centigrade, the condensor produces distilled water at a rate of 22 tons/day. Vacuum condensors with such high capacities are rare aboard dry cargo vessels. Its installation aboard the "Kapitan Trubkin" is explained by the need to supply the vessel's sanitary system with fresh water.

The Showa Marine Kogo fuel mixing unit for the diesel generators is interesting. It produces a 7:3 heavy/light fuel mixture. The unit is designed to prepare mixtures consisting of 20 percent diesel fuel and 80 percent heavy oil and is extremely reliable.

The vessel has a system to prevent marine life contamination of steam conversion units and piping by electrolyzing chlorine in outboard water. This

electrolyzed water is fed to kingston valves and prevents marine life growth in the vessel's outboard water system. There is also an electric heating system for the electric pump motors. This system prevents insulation resistance droop and is automatically engaged when the pumps are started.

Marine environmental protection systems include a 20 cubic meter bilge collection sump. Bilgewater is pumped out on both sides of the ship. Pump remote control panels are located on both sides of the main deck.

A Sasakura Turbulo TFV(A) bilgewater separator provides the required degree of oily bilgewater cleaning at a maximum flow of 2 cubic meters/hr. There is a pipeline to conduct oily water to a collection tank when a certain petroleum content level is exceeded. A 3-way valve with an electric motor is fitted to the piping for this purpose. When petroleum content is greater than the allowable limit, the device emits a signal to the valve which switches water flow from the side outlets to the collection tank within 4-5 seconds.

Petroleum residue is collected in special sumps from which it can be transferred to a special 8.5 cubic meter tank by way of a screw-type pump/dryer with a 2 cubic meter/hr capacity. The special tank also receives petroleum residue from the hold water separator. Bilgewater and petroleum residue pumping takes place in the same pipeline by means of the 2 cubic meter/hr pump/dryer.

The Sasakura Super Trident ST-6 biological cleaning system for waste water is designed for 60 persons.

The vessel has two metal garbage containers with hermetically sealed lids. They have a capacity of 1 cubic meter and are set up so as to facilitate the transfer of garbage to barges. These containers were installed when the vessel was accepted.

The ship's radio equipment from the Japanese IRC firm consists of a console which includes combined medium wave (400 W) and short wave (1.2 kW) transmitters, a universal, 75 W emergency transmitter operating on medium wave, short wave and 2182 kHz frequencies, primary and standby all-band receivers, automatic alarm, detector, automatic distress and location transmitters, etc. The radio room is equipped with a facsimile device. There is a wharf communication amplifier and a lifeboat radio station.

All the ship's cabins are for one- or two-person occupancy and feature lavatories as well as air conditioning. The wardroom adjoins the salon and the mess adjoins the recreation room.

The "Kapitan Trubkin" has completed several voyages since acceptance and has demonstrated good operational data as well as the ease with which its equipment can be used.

12746
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YAMBURG PORT, RIVER TRANSPORT DEVELOPMENT IN FAR NORTH

Moscow VODNYY TRANSPORT in Russian 25 Sep 84 p 2

[Article by I. Kocherga, deputy chief of the Ob-Irtysh United Shipping Company and chief of the Port of Salekhard: "Western Siberia: A transport resource examines Yamburg"]

> [Text] Not long ago the word "Yamburg" flashed across newspaper pages. Now, the name of this new source of "blue fuel" opened in northern Tyumen Oblast is known in this country and abroad.

The Yamburg condensed gas field is located beyond the Arctic Circle in the northern part of the Tazov Peninsula, far from developed industrial bases. bases. Ob-Irtysh United Shipping Company rivermen first became acquainted with Yamburg in the fall of 1982. At that time transport fleet teams successfully completed an expeditionary shipment of cargo to the first working party landed on the shores of a faraway stream with the long name of Nyudya-Mongoto-Yepoko. The Ob Gulf served to carry many important cargos including provisions, equipment, construction materials and fuel.

Tens of thousands of tons of vital cargo was carried by the Ob-Irtysh United Shipping Company fleet last year. However, the tasks facing the shipping company collective during this navigation season are nothing compared to that accomplished by rivermen in the last two years. In this short polar navigation season hundreds of thousands of tons of general cargo are to be delivered to Yamburg's wharves. The primary consignees are the USSR Ministry of Petroleum and Gas Construction, the USSR Ministry of the Gas Industry and the USSR Ministry of Transport Construction. To accomplish its tasks the shipping company collective, together with personnel from other ministries and agencies, has adopted a series of organizational and technical measures. In order to get from the Ob Gulf to the mouth of the nonnavigable Nyudya-Mogoto-Yepoko river, an access canal had to be built, a landing area had to be hurriedly prepared and wharfs had to be equipped. The Zapsibirgidrostroy trust from Surgut building an industrial port in Yamburg, was assigned the task of expanding the landing area to a volume of 240,000 cubic meters.

However, he Ministry of Transport Construction personnel could not handle the situation nd completed only 45,000 cubic meters of the planned volume. This

seriously complicated subsequent transportation operations. Additional measures were taken to ensure timely development of navigation in the northern area of the basin.

On 1 July a powerful dredging team made up of two scoops and the dredge "Urengoy" followed an icebreaker into Yamburg. After 20 days of concentrated work the Irtysh Basin Route Administration rivermen succeeded in opening an access canal, widening the port waterfront and securing access to the wharves.

During this work a temporary access canal was prepared in addition to the planned channel. The first heavily laden barge arrived in Yamburg on 24 July. At that time regular river traffic began on the Labytnangi-Yamburg express freight route. Direct carriers left from Tobolsk, Surgut and Sergino with cargo bound for Yamburg.

The shipping company's operational plan called for shipping mixed gravel/sand cargos from the Pechora Basin to Labytnangi by railroad and then transferring these construction material loads to riverboats. The fleet was increased to handle this traffic.

Unfortunately, the USSR Ministry of Petroleum and Gas Construction's discussions with Pechora Basin officials have bogged down and as yet no Pechora gravel shipments have been organized. Ob-Irtysh United Shipping Company personnel had to quickly correct their plan and search for new sources of cargo. An answer was found. A Sob-Yamburg-Sob route was organized using "Omskiy"-class dry-cargo ships to haul gravel/sand mixtures.

The Sob is the left tributary of the Ob River and has its source in the Ural polar region. Until this year few knew of this river, even in our own basin. In June of this year the shipping company collective set out to develop gravel quarries in the Sob Basin and has already delivered tens of thousands of tons of this valuable cargo to Yamburg wharves as well as to construction sites in Tobolsk, Surgut and Tyumen.

Recently, Salekhard port personnel organized a new cargo area at Yamburg. Roadstead work was accomplished by two tugs, one of which contained the temporary cargo yard office. The vessels were provided with independent communication to Salekhard. At this time work is underway to form a river personnel base on the shore: two housing trailers have been set up, a dispatch center is under construction and communications are being established.

Cargo unloading is facilitated by five floating cranes and a shore crane with a capacity of 120 tons. Recently this equipment was supplemented by an additional floating crane sent from the port of Salekhard to unload gravel/sand mixtures.

In Yamburg, the center of a great deal of construction work, the shipping company's headquarters coordinates the interaction of company personnel, cargo

consignees and port construction personnel. V. Ivanov, second secretary of the Nadym city party committee, heads this office.

A ship/crane/truck plan is used to unload cargo at the Yamburg wharves. The direct method of fleet cargo handling would be impossible under difficult Zapolarye conditions without the cooperation of all elements in the transportation chain. First of all, it would be unthinkable without coordinated, around-the-clock trucking support.

From my experience with previous navigation season work in Nadym and Urengoy I know that success in the initial, and most difficult step, of opening a new site depends largely on strict centralization of all cargo operations.

Unfortunately, so far departmental harmony is not in evidence at Yamburg wharves. Operations are suffering as a result: the fleet is standing still and cranes are not being used efficiently. In my opinion a single facility should be established to handle all cargo destined for the primary consignee, "Nadymgazprom" [the Nadym Gas Industry Administration].

For many clients on the Yamburg wharves we have offered to set up individual unloading teams made up of handlers, crane operators and drivers and to establish a system of moral and material incentives. This has occurred at Nadym and Urengoy .

In a word, definite unloading operations need to be organized for each consignee. If this is not done departmental divergence will lead to lengthy delays for the fleet. In the end this will result in irrecoverable losses of navigation time. We already have examples of this.

Barge MP-505 waited more than three days to unload 6 girders and barge MP-496, carrying heavy cargo destined for the Nadym Gas Industry Administration, waited an abnormal amount of time, four days, to unload. In the first days of traffic much confusion was observed in tanker offloading operations. Now there is a petroleum wharf and combined arrangements were planned on the Ob Gulf. It seemed that matters were proceeding well. But again tanker offloading is plagued with interruptions as there is not enough fuel storage capacity. We understand that every new operation involves setbacks but we would like to see fewer of these.

Now the Ob-Irtysh United Shipping Company and all Yamburg consignees are confronted with the specific task of unloading not less than 6-7 thousand tons of cargo daily. The shipping company has sufficient ships and cargo to meet this goal.

Considering this, we have to solve our own problems. A reliable company collective has to be set up quickly in Yamburg. Further, Yamburg is in an area of open sea sailing conditions and this new cargo region requires oceangoing vessels to bunker fuel, to collect contaminated water and to carry out roadstead-maneuvering area work.

Important matters must be resolved to secure safe sedimentation facilities for the fleet and to furnish the working parties with provisions and industrial supplies. At the same time it is appropriate to examine current questions on expanding and improving the Salekhard port repair base which services the northern fleet group. Of course, the tasks of building the Yamburg port as well as expanding its harbor and wharf facilities must be speeded.

The Tyumen Oblast and Salekhard Okrug CPSU party committees have focused a great deal of attention on bringing the Yamburg gas condensate fields into operation as quickly as possible. There are still many problems which will be tomorrow's complicated questions. Today the Yamal riverworkers have no greater task before them than that of securing a full volume of goods traffic to Yamburg on schedule.

12746
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MARITIME AND RIVER FLEETS

COMMO SYSTEM MODERNIZATION FOR MARITIME FLEET

Moscow VODNYY TRANSPORT in Russian 16 Oct 84 p 3

[Article by A. Belik, expert, and V. Krest'yaninov, senior expert, both of the All-Union Marine Communications via Satellite Association: "Earth, this is 'Sokol'"]

> [Text] Maritime fleet radio communication is one of the most important elements assuring the safety and operational control of ships at sea. It is highly flexible and allows communication to be established within minutes between points separated by thousands of miles.

The words "speed, accuracy and economy" sum up the primary requirements applied to data transmission systems. A vessel at sea is connected to all shore facilities by a single thread—the radio channel. A radio channel can be characterized by many parameters but the primary one is the variability which results from the nature of radiowave propagation. A radio signal is influenced by the ionosphere, weather conditions, interference, etc. Due to this lack of continuity a ship may not be able to hear its shore-based radio center for several hours a day. This is highly undesirable in these days in which time is always in short supply.

Channel quality is defined by the number of errors occurring during communication. On the average, a marine radio channel has a constant rate of 2-3 errors per 100 characters transmitted or received.

As we know, automatic control systems based on computer technology are in wide use. For normal operation these systems must not have more than 1 error per 1 million characters entered in the computer and data efficiency time (the time required to receive data from a vessel) not greater than 30 minutes.

Until recently the primary means of radio communication with ships was via Morse code. This involved an average working rate of 80-100 characters per minute. Morse code operations demand the presence of a radio operator and a great deal of human effort to listen for the "right" sounds in a sea of noise. It is obvious that this type of operation is unsuited to modern speed and information processing quality requirements.

At present, Ministry of the Maritime Fleet shipping companies are being equipped with a new system for providing radio communication to ships via direct character printing and character printing with error correction.

Marine radio character printing takes place by means of an automatic telegraph and a printer, using the ITC-2 international telegraphic code. The use of this equipment has significantly simplified message processing since transmission and reception take place automatically at a speed of at least 400 characters per minute. If equipment designed to increase accuracy is employed with these units, data transmission quality can also be improved at high processing speeds.

The operating mode which incorporates accuracy improvement systems is called character printing with error correction.

The present radio communications system for the maritime fleet at sea widely utilizes accuracy improvement equipment equipped with arbitration feedback implemented according to Recommendation 476-2 of the Consultative Committee in International Telegraphy and Telephony (CCITT).

With this system the radio operator simply places a perforated tape containing the message in a telegraph unit connected to a transmitter, receiver and error correction unit. The message is automatically transmitted to the other end of the communications link, where it is received. This system automates the process of ship communications, increases data efficiency, reliability and confidence and reduces the amount of hand labor performed by shore-based and vessel radio operators. All this provides recognized advantages.

The practical application of domestic Sokol-MR error correcting equipment has demonstrated its high efficiency and economy.

The All-Union Marine Communications via Satellite Association has constantly been faced with the task of introducing new technology to ships and shipping companies as rapidly as possible.

One of the current means of speeding the introduction of new communications technology in the Ministry of the Maritime Fleet is the use of the program-targeted control method to develop targeted overall programs.

In 1980 we developed the first production-targeted program to equip Baltic Shipping Company [BSC] vessels with the hardware necessary to provide character printer radio communications. According to this plan, a series of measures, coordinated in terms of resources, personnel and time schedules, was prepared to introduce new communications technology in the shipping company. The results achieved by the BSC (the company now receives about 80 percent of all data from ships via direct character printing) showed the correctness of the planning direction adopted as well as the high efficiency of such production programs.

Similar targeted programs are being used to implement the All-Union Marine Communications via Satellite Association's technical policy in other shipping companies.

The overall program approach to introducing new means of assuring marine radio communications allows the shipping companies to keep a finger, so to speak, on the pulse of new technology, clearly plan their financial resources for the acquisition of radio equipment, coordinate radio equipment installation schedules with ship overhaul schedules, reduce the percentage of uninstalled equipment, rapidly introduce new technology and speed realization of the consequent economic impact.

The Baltic Shipping Company (L. Lezhnin), Estonian Shipping Company (B. Yors) and Lithuanian Shipping Company (Yu. Shilin) were among the first to understand and recognize the need to develop and introduce such overall programs.

In 1981-1982, targeted overall programs were developed under the leadership of the Marine Communications via Satellite Association with the active participation of specialists from the above shipping companies and, later, from the Maritime Fleet Scientific Research Institute and the Leningrad Higher Maritime Engineering School imeni Admiral S. O. Makarov. The shipping companies then set about implementing these.

Using the suggestions to improve efficiency provided by Estonian Shipping Company radio operators, modern mass-produced Sokol-MR equipment (A. Kondratyuk, A. Mitchenko and others), practical experience with the direct character printing mode and technical solutions provided by the Central Communications Administration of the Ministry of the Maritime Fleet, significant progress was made in a short time toward solving technical questions on the unmanned servicing of vessel radio stations equipped with character printers and Sokol-MR error-correcting equipment. Now, information prepared in advance can be "taken" from a ship even if the radio operator is not on duty and not physically present in the communications center.

Now some of the results of using targeted overall programs can be listed: programs have been implemented for direct character printing in the Baltic and Lithuanian shipping companies, the Latvian Shipping Company program will be completed in 1984 and programs are in the implementation stage for the Estonian and Novorossisk shipping companies (character printing with error correction). The annual economic effect of introducing the targeted program was 67,700 rubles for the Lithuanian Shipping Company. The 1983 tasks set by these shipping companies for handling marine communications by the character printing mode were successfully completed.

It must also be noted that the functional flexibility, broad scope of application and low cost of such systems give every basis for believing that, when combined with satellite channels, radio communication using character printers and error correction will in future play a great role in the data transmission system serving this country's merchant fleet.

In our opinion, specific use of the program-targeted control method to speed the introduction of new technology in the Ministry of the Maritime Fleet communications system will provide even more tangible results in the future.

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TECHNICAL ADVANCEMENTS IN AZOV SHIPPING COMPANY FLEET

Moscow MORSKOY FLOT in Russian No 9, Sep 84 pp 44-46

[Article by I. Bolyukh, chief engineer of the Azov Shipping Company: "On course to technical and scientific progress: Pathways of technical advancement"]

[Text] The basic developments in shipping company technical progress have been and remain the introduction of new methods, progressive technology, advanced labor resource organization techniques, the use of advanced experience and the introduction of inventions as well as efficiency suggestions from production innovators.

Continuous and comprehensive efforts are carried out to promote advancement at the Azov Shipping Company. At the beginning of the 11th Five-Year Plan the company and its facilities outlined plans for further technical development of the fleet, ports and commercial facilities, aimed at mechanizing manual labor and increasing labor productivity.

In the first three years of the current five-year plan the Azov Shipping Company saw the introduction of 460 scientific and design/construction projects resulting in an annual economic impact of some 5.8 million rubles. More than 6 million rubles have been realized during this period from the introduction of plans for new shipping company, port and plant technology. Production facilities have seen the introduction of 700 machines, devices and advanced industrial processes resulting in an economic impact of 11.8 million rubles.

Potential production problems are solved by the shipping company in cooperation with scientific organizations. During the last three years the shipping company has concluded 70 agreements for a total of some 300,000 rubles with 18 scientific research and design/construction organizations, with a total economic impact of 2.5 million rubles anticipated from the introduction of these projects. The practice of concluding economic and cooperation agreements with various scientific and design organizations is widespread.

The shipping company's fleet is constantly being renewed. In the first three years of this five-year plan, seven new ships have been received and four have

been sent to the Black Sea Shipping Company. During this time 14 ships were transferred. In spite of the fact that older ships are being written off at a rapid rate, overall Azov Shipping Company tonnage for that period increased by approximately 20,000 tons. New ships, with larger capacities than the old ones, are fitted with modern equipment and as a rule are more highly automated. Modern specialized ships have costs ranging into the tens of millions of rubles. This places a higher importance on their safe and effective use. Fleet replacement efforts will continue.

A great deal of work is being carried out by the company to modernize the current fleet. At the present time a nearly total modernization of communication and radionavigation systems is underway. Remote automated control systems are being installed on "50-letiye Komsomola"-class ships. All vessels sailing in foreign waters and some coastal ships are being fitted with new equipment to comply with the requirements of international conventions on lifesaving at sea and on vessel pollution control (SOLAS-74 and MARPOL-73/78).

The conversion of ship engines to heavy fuel is continuing. In the first 3 years of the 11th Five-Year Plan the company's fleet has saved 21,400 tons of conventional fuel and 305 tons of lubricants.

During 1981-1983, 18 company ships were converted to working with reduced crews.

To speed the processing of agricultural cargos, Azov Shipping Company port collectives have been hard at work on introducing new technology, mechanization and advanced processes to reduce the amount of strenuous manual labor involved in loading/unloading operations.

The development of packet and container cargo handling at basin ports has allowed a labor effort reduction of more than 20 percent. In 1983 alone, 1,250,000 tons of economic goods (about 70 percent of general cargo suited for packaging and containerization) were processed with these new methods.

To increase the volume of container and packaged cargo traffic the question of containerization at the ports of Kerch and Berdyansk (with volumes of up to 100,000 tons) is being resolved with external trade associations. New methods of organizing container cargo planning are being introduced. A container dock is being built at Zhdanov. Using these measures, by the end of the 11th Five-Year Plan, the annual container cargo volume is expected to be 250,000 tons and packet cargo is expected to reach 1,250,000 tons. Thus, 75 percent of packaged loads will be processed in packets and containers.

The use of new, highly automated materials handling equipment occupies an important place in port operations. This equipment includes lifting and hauling machinery, cargo grappling machines and transshipment systems allowing the mechanization of heavy manual labor. Thus, in 1983, five obsolete port cranes were replaced. For cargo processing, port materials handling

facilities received 76 internal combustion and electric lift trucks with capacities from 1.5 to 16 tons.

Port mechanization renewal programs in 1981-1983 raised the level of system automation by 0.9 percent. Each year up to 50 trailers are delivered to ports. These eliminate the need to transfer cargos to warehouses. A great deal of attention is focused on the processing of food shipments. Mechanized grain transfer units, railroad car loading equipment and fully mechanized and automated systems with railroad scales have been introduced at the ports of Zhdanov and Berdyansk permitting a reduction in manual labor and producing an economic impact of up to 100,000 rubles per year.

The port of Zhdanov will soon see the introduction of a system to thaw frozen railroad car loads of coal. This will secure an economic impact of nearly 100,000 rubles annually. A mechanized pallet handling line, with a capacity of 8,000 pallets per year, has been introduced. This will free workers from hard physical labor.

Serious attention at Azov Shipping Company ports is being paid to the refurbishing of industrial process and the introduction of typical mechanized systems involving low labor requirements. These processes have been made possible because rolling stock carriers have been added to the shipping company's fleet.

Thus, the technique of handling citrus products and asbestos in packets on such vessels has allowed the number of docker team personnel working on the handling line to be reduced from 19 to 6 persons while the handling rate increased.

In Zhdanov alone, this has resulted in an economic effect of 174,000 rubles per year and has freed railroad cars for use.

Significant savings are obtained through reducing physical labor costs by processing goods according to the direct variant, whose share continues to grow from year to year. In 1983 about 6,000,000 tons of cargo (or over 32 percent of the total cargo volume) in the basin was processed using this progressive method. However, the company's container fleet is not fully used due to the fact that the railroad does not return all containers, industry does not containerize individual, labor intensive cargos and some of these are not accepted by shippers.

Azov Shipping Company port workers are faced with the tasks of further building up cargo handling volumes and increasing the overall mechanization of loading/unloading operations. In 1983, the actual volume of total cargo operation mechanization at company ports was 96.4 percent (the plan called for 96.2 percent). However, this is not sufficient for present day conditions. According to the Ministry, on the average, overall mechanization of port cargo

handling operations has reached 94 percent, however, the remaining 6 percent of manual labor operations not fully mechanized involves up to 30 percent of overall port work forces.

Ship repair yards (SRYs) are making a great contribution to the work of introducing new technology and progressive methods in all phases of their programs, including ship repair, shipbuilding and machine construction. In 1983, Azov Shipping Company SRYs built petroleum/garbage barges, lighters, water carriers, harbor launches and bunker facilities for grain transshipment in ports. Additionally, the yards produced a total of 382,000 rubles of consumer goods (of a plan value of 340,000 rubles).

In the course of measures to speed scientific/technical progress in SRYs, 287 projects with an economic impact of more than 2,000,000 rubles have been carried out. The introduction of progressive technology and the increased level of mechanization at basin industrial facilities has increased labor productivity by 9.3 percent in the last 3 years. Among the most effective measures introduced at company yards during the 11th Five-Year Plan are automatic vessel side cleaning units at Zhdanov and Kerch SRY docks; a bottom cleaning machine based on an electric lift truck at the Zhdanov SRY; the Topaz and Luch painting units for air-spray paint application and a technique for restoring MAN and Zulzer engine piston crowns at the Zhdanov SRY; an edge trimming unit to prepare plates for welding at the Kerch SRY; a cargo grapple/handler, the KZPT crane grapple, a cargo grapple/pusher and the PST-100 hold loader at the Bedryansk SRY.

Ship repair yards are always strengthening and improving the relationship between science and production. On the basis of agreements and through creative cooperation, the Zhdanov SRY works with 12 scientific research institutes, design/construction organizations and institutes of higher learning in this country.

Yard labor collectives pay a great deal of attention to saving raw material, equipment and fuel/energy resources. To ensure a reduction in fuel, electric and heat energy, yard workers together with scientists developed the Targeted Overall Program to save fuel/energy resources in the period from 1981-1990. Individual item savings introduced at all branches of the Bedryansk SRY allowed the plant collective to achieve the high honor of "Most Economical Enterprise in the City" for the first half of 1983 and to take first place in the All-Union review of raw material, equipment and fuel/energy resource utilization efficiency, winning the cash first prize for 1982. Paying constant attention to increasing product quality, the Bedryansk SRY collective developed and introduced a quality control system, thanks to which six of their products received the State Emblem of Quality.

The task of certifying manual and labor intensive work in basic and auxiliary production at Azov Shipping Company facilities is ending. Through this certification process, cumulative plans calling for the reduction of manual labor have been developed for the current five-year plan. Many

engineering/technical personnel have their own creative plans. For example, engineers at the Berdyansk SRY are working under the slogan "Worker Initiative—Engineering Support." The economic impact of the introduction of individual creative plans at the yard in 1983 was about 30,000 rubles.

In implementing the Targeted Overall Program for the reduction of manual labor developed by the VTsSPS [All-Union Central Trade Council], the SRYs are bringing to life similar programs to reduce manual labor during the five-year plan and into 1990. Fulfillment of these programs at the Kerch SRY alone during three years of the current five-year plan has shifted 65 persons from manual labor to mechanized work, facilitated the manual labor of 135 workers and produced an economic impact of some 50,000 rubles.

Efficiency experts and inventors are making a significant contribution to speeding scientific and technical progress. In the last five years their number has increased by 4.5 percent in the company's fleet and facilities. The total savings produced as a result of introducing innovations has risen to 26,000 rubles.

Now the company's collective is faced with the task of successfully completing the 11th Five-Year Plan. We have a lot to do in order to assure that the fleet operates more effectively and that shore facility development matches specialized fleet capacity. It is essential that the creative initiative of engineering/technical personnel and production innovators be directed toward solving these critical matters.

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MARITIME AND RIVER FLEETS

NUCLEAR-POWERED ICEBREAKER 'ROSSIYA' PROFILED

Leningrad SUDOSTROYENIYE in Russian No 8, Aug 84 pp 3-6

[Article by V. Ya. Dem'yanchenko and S. G. Livshits: "The Nuclear Icebreaker 'Rossiya'"]

[Text] In the beginning of November 1983, on the eve of the 66th Anniversary of the Great October Socialist Revolution, the nuclear powered icebreaker 'Rossiya' was launched at the Baltic Shipyard imeni Sergo Ordzhonikidze. The prototype ship in this series, the 'Arktika', (and since 1982 the 'Leonid Brezhnev'), went into operation in 1974, and in 1977 the client was delivered a second icebreaker, the 'Sibir''. Arctic navigation experience has shown their high technical and operational qualities. Incorporating the latest achievements of domestic science and engineering, these icebreakers are still the most powerful in the world and the most modern ships of this class.

The presence of two nuclear icebreakers on the Northern Sea Route has increased the navigation season to 8-9 months, and in the western sections navigation is possible practically all year around. The passage speed of merchant ships has more than doubled and diesel-electric powered line icebreakers have become more active. Nuclear icebreakers' reliable, steady operation has helped sharply improve the efficiency of the entire transportation system in the Arctic. One can now assert that the levels of transport service provided in the Arctic basin and the extension of the navigation season on this route would be impossible without nuclear icebreakers.

Nuclear ships' good icebreaking qualities and the operational reliability of their main and auxiliary equipment and systems were convincingly demonstrated during high latitude runs. In August 1977 the 'Arktika' was the world's first ship to reach the North Pole by short term autonomous navigation. In the Spring of 1978 the 'Sibir'' led the merchant ship 'Kapitan Myshevskiy' on a 16 day through, high latitude voyage from west to east. The successful operation of nuclear icebreakers on traditional Northern Sea Route runs and the positive results from high latitude scientific-practical voyages were reasons to continue the construction of ships of this class.

In the period since the development of the design used in building the first two ships, there have been changes in the USSR Register Rules, new international conventions have gone into effect, there has been substantial modernization of mechanisms and equipment supplied by industry (this especially applies to

further improvements in ship equipment reliability and repairability and improved servicing conditions). Extensive experience in the winter navigation season operation of icebreakers has been acquired. All these factors were taken into consideration in correcting designs, giving rise to several qualitative differences between the 'Rossia' and previously built ships. Nevertheless, there have been practically no changes in the main elements and specifications:

Length, meters	
Length overall	150.0
Length on designed waterlines	136.0
Breadth, meters	
Beam	30.0
At designed waterline	28.0
Side height to upper deck, meters	17.2
Draft at designed waterline, meters	11.0
Displacement, tons	
Unloaded	20,480
Maximum	23,460
Power of nuclear power plant, kW	55,000
Tractive effort on tow lines, kN	4,700
Maximum speed in open water, knots	20.5
Crew, (excluding medical personnel and aviation detachment)	142

The retention of the main dimensions and power plant capacity is due to successful experience in operating the first two ships, which proved themselves well in the Arctic's changing conditions.

However, in the past decade new factors were discovered which negatively affect the icebreakers capabilities of moving through ice: the avalanche ice build-up [lavinoobraznoye oblipaniye] of the underwater parts of the bow section with snow and ice mass sometimes causing the ships to stop, sharp increases in the friction component in the overall ice resistance balance at low air temperatures, increased intensiveness of interaction between the propellers and ice.

Because of this, a set of design decisions were introduced on the 'Rossiya'. They are directed towards retaining and further improving its ice qualities in winter conditions: a system for heating the exterior plating in the ice belt area, ice deflectors for the propellers, etc. Great attention was given to means of fighting hull corrosion, leading to increased surface plating roughness and, as a consequence, to increased friction resistance.

There have been changes in the icebreaker's equipment for ice reconnaissance, including during the polar night. It has equipment for the storage and complete technical servicing of a Ka-32 helicopter, specially equipped for all-weather short range ice reconnaissance. A special apparatus for receiving information

on ice cover conditions long distances away was installed. An experimental model of this was tested on the 'Sibir'' and demonstrated its great effectiveness in receiving operational information. A set of the latest equipment assures the solution of navigation problems at high latitudes and supports all types of operational communications with the mother ship and ships in the convoy. These, of course, do not exhaust the innovations in the 'Rossiya's' design. Literally every device or design decision was subjected to critical analysis, using experience from the operation of previous ships.

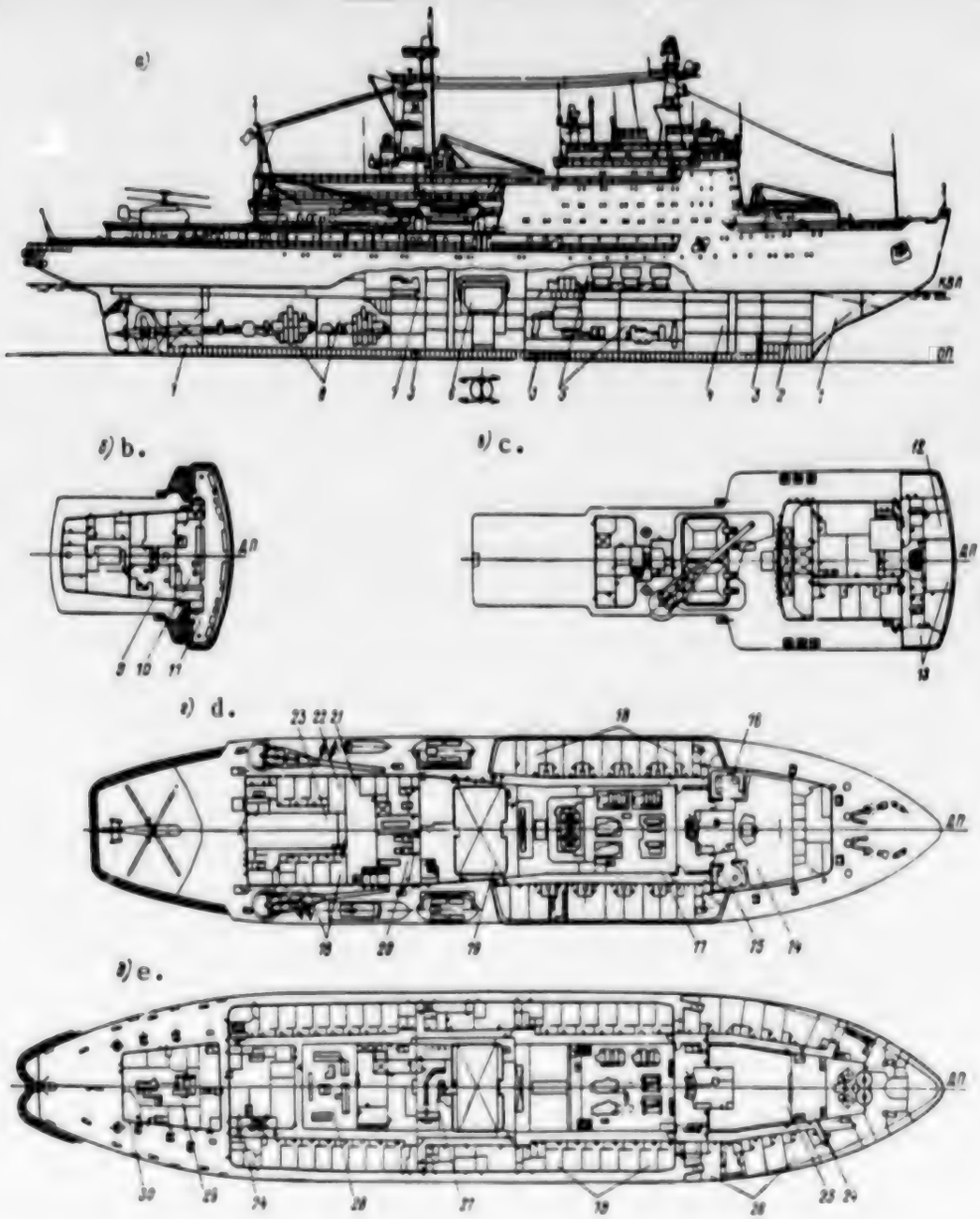
The architectural-design class of the 'Rossiya' is a three propeller, turbo-electric drive, with excess freeboard, four decks, a forecastle and a five deck superstructure. Seven main transverse bulkheads divide the hull into 8 watertight compartments. Although these bulkheads extend to the upper deck, to assure unsinkability even with two compartments flooded, the design made provisions for a second deck. Because of this it was not possible to install sliding watertight doors. Instead, there are hung doors, substantially increasing boyancy reserves in emergency situations.

The nuclear steam generating units (APPU) are located in a separate compartment amidships. Forward of this is the section for the main turbogenerators and auxiliary equipment, the main distribution panel No. 1 (GRShch-1) and block for provisions and the galley. Abaft from the APPU is the aft electric generating unit, the GRShch-2, the sections for the side and middle electric motors, a machine shop and spare parts block and an aviation fuel tank. Trimming tanks are in the extreme ends of the ship. The side sections have keeling and ballast tanks, tanks for fresh water, diesel, turbine oil and auxiliary spaces. The section between the double bottoms is for liquid ballast.

The hull is made from high strength steel. The framing system is transverse, with main and intermediate frames. Strain measurement testing in natural conditions showed that preceding icebreakers had sufficiently strong hull structures, so no fundamental changes were made for the 'Rossia'.

The power source is the nuclear steam generating unit, consisting of two blocks, each of which includes a pressurized water type reactor and the appropriate auxiliary equipment. The installation is located in a gas tight compartment, separated into an upper area for equipment and a lower one for the reactors. The latter is divided by a hermetic bulkhead into two compartments for the APPU blocks. Long term experience in the operation of these types of units in Soviet nuclear powered icebreakers has shown their high reliability and trouble free operation. They are distinguished by simplicity of servicing, easier repairability and have high techno-economic indicators.

Radiation safety in the ship is assured by the appropriate design and organizational measures and monitored by a comrehensive automated system, using signals from dosimetric transmitters and indicators registering the processes occurring in the reactors and the state of the reaction zones. Experience in the operation of similar equipment on active ships gives basis to assume that the 'Rossiya' will have a reliably monitored APPU and the complete radiation safety of the crew will be assured.



Overall Views of the 'Rossiya': a. Side View, b. Fourth Bridge, c. Third Bridge d. Forecastle Deck, e. Upper Deck.

1. Trimming tank
2. Trimming pump room
3. Walk in icebox
4. Galley and stores
5. Main turbogenerator and auxiliary equipment room
6. Nuclear steam generator
7. Bow generator set
8. Main drive electric motors
9. Radio shack
10. Chart room
11. Pilot house
12. Officers cabins
13. Capitan's cabin
14. Crew's cabins
15. "Nature" saloon
16. Recreation room
17. Auxiliary boiler and water distiller
18. Single bunk cabins
19. Apparatus room
20. Emergency diesel generator set
21. Sports room
22. Trainer room
23. Helicopter hanger
24. Ventilators
25. Crew's mess
26. Two bunk cabins
27. Sewerage disposal
28. Central control
29. Towing winches
30. Stern control station

The icebreaker's steam turbine unit consists of two main turbogenerators with capacities of 27,500 kW each, 5 auxiliary turbogenerators, turbo-feed, circulation and electrocondensate pumps, and a number of auxiliary mechanisms and units. The basic engineering solutions for the steam turbine units remain the same as those for previous icebreakers. However, practically all auxiliary mechanisms have been replaced and a number of design improvements made: the oil lubrication system in the main turbogenerators has changed, there are substantial improvements in the acoustic characteristics of steam valves and other units. Great attention was given to improving the longevity of pipes for outboard water: their diameter and thickness were increased, molded and welded components were replaced by cast ones, etc.

The 'Rossiya's electric propeller drive unit is dual current: alternating current in the generator and direct in the motor part. The rectifiers are static valve devices, converting 3 phase 110-125 hertz, 780 V to 1000 V dc. The two armature air cooled electric motors have a total power of 2x8800/8100 kW and rotate at 130/185 rpm. They receive electrical energy through copper buses in special passageways and covered conduits. The electric drive in the 'Rossiya' has been strengthened, changes made in the system for ventilating the electric motor and main generators, in the cooling system for rectifiers, distribution panels and other units.

The icebreaker's electric power plant consists of 5 auxiliary turbogenerators of 2000 kW each, 1 reserve 1000 kW diesel generator and 2 emergency 200 kW diesel generator sets. The electric power sources are located so that in any emergency situation there would be a continuous supply to the main important users. Two auxiliary turbogenerators make up the bow electric power plant; 3 and a reserve diesel generator set, the stern station. All the engineering solutions to electric power supply have completely proven themselves during the operation of the first ships in the series.

The automation equipment on the icebreaker is grade [znak] A2 in the USSR Register and provides for the control of equipment from a central post, without having constant watches in the engine room. The comprehensive automation system consists of several subsystems: automatic regulation, control and protection of the steam turbine unit, reactor control and protection, remote and automatic control of ship systems, automatic control of electrical energy unit, collection, processing and display of information. The system has a modern component base distinguished by high reliability and operating capacity.

In correcting the design great attention was given to further improvements in the ship's livability. Main efforts were directed towards reducing noise and vibrations. Although, as repeated measurements have shown, the acoustic environment on operating nuclear icebreakers is better than on any other similar type ship, the task is still urgent. To improve the acoustic environment, some of the living areas located in the bow section of the second deck (the most unfavorable part of the hull with regard to noise and vibrations), were moved to the superstructure. For the same reason the medical unit was moved from the bow section of the upper deck to the second bridge.

There have been substantial improvements in the acoustical insulation for the cabins remaining in the second and upper decks. These use improved design "floating" enclosures. There is also improved vibration insulation for piping to cabins, doors have been installed without ventilation gratings and knock-out panels, the portholes have double glass. The introduction of these and other measures, and further improvements the acoustical characteristics of ventilation and air conditioning systems will make the 'Rossia' highly livable.

The ship's crew is housed in 149 cabins: 11 block cabins, 120 single bunk, 14 two bunk and 4, six bunk cabins. The latter are intended for temporary personnel: trainees, repair workers, etc. All single bunk cabins, including block units, are equipped with video monitors hooked up to a central translator. The housing areas are furnished with soft and semisoft furniture, meeting new standards.

General use facilities include a crew room, mess hall, agitroom, library, recreation hall, "Nature" hall, a chess room, club, class rooms, and a sports complex. The crew room is 112 m^2 in area, is located in the forecastle and intended for 56 people; it also is used for the crew's recreation evening. The "Nature" saloon is to the starboard of the crew room and has live flowering plants and an aquarium. It also has a large panorama showing nature scenes from central Russia. The recreation room is to the port side. The crew mess, located on the upper deck, is 128 m^2 and intended for 84 people. On the second deck there is a club capable of holding 100 people and equipped with a built in movie projector. The vestibule in front of the club has a ship museum display case. Facilities such as a service center , barber shop, laundry, and photography room have a big role in the crew's life and leisure.

The sports complex consists of two facilities. The first is in the forward superstructure. It consists of a two deck 53 m^2 hall with trainers, sports equipment, accessories and a shower. Here one can play volleyball, basketball, table tennis, box, lift weights, do gymnastics, train on stationary bikes and other trainers. The second unit is a 7.5 by 3 meter pool and sauna. It has a recreation room. The interior decorating of the living and public areas is varied. The interiors of the public areas make wide use of live flowers, decorative items and art, decorative fiberglass and modern coverings.

Workers at the Baltic Shipyard imeni Sergo Ordzhonikidze decided to give a labor gift in honor of the 27th CPSU Congress and put the 'Rossiya' into operation ahead of time. They called upon the country's collectives to struggle to successfully fulfill five-year plan targets. This deed was approved by the CPSU Central Committee. The new nuclear icebreaker now has a worthy place among the nuclear giants supporting navigation along the Northern Sea Route.

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RIVER FLEET MODERNIZATION SCHEME CRITICIZED

Moscow RECHNOY TRANSPORT in Russian No 7, Jul 84 pp 32-33

[Article by Doctor of Technical Sciences G. Vaganov from the Gorkiy Scientific Research Institute for Water Transport: "A New System of Vessel Classes: Merits and Shortcomings"]

[Text] Since 1983, a new system of standard transports and roaders of the MRF [Ministry of River Fleet] has been in effect and construction of these vessels should start in 1986.

There is no need to take up in detail the importance of the new system, like the previous one, for the development of the river fleet and for the forming of its composition. The standardization of the river fleet on the basis of these documents makes it possible to significantly increase the number of vessels built in a series and thereby substantially reduce their construction cost. Moreover, in having large series of vessels, the shipping companies have an opportunity to better organize traffic on the cargo routes and provide more intense processing of the fleet in the ports. With the presence of a significant number of standard vessels in a basin, it is possible to better supply them with spare parts and interchangeable mechanisms and to specialize the ship repair enterprises. All these advantages help to reduce operating expenses and the costs of hauling cargo and passengers.

The new system, like the previous one, consists of two sections: the first includes standard vessels designed for series construction from 1986 using already elaborated and approved plans, while the second contains future vessels for designing and construction over the more distant period. The first section includes 16 classes of cargo diesel vessels and tankers, 10 tugs, 16 nonself-propelled vessels and 13 passenger vessels. In comparison with the previous system, the number of classes of cargo diesel vessels and tankers has been increased by 4, nonself-propelled vessels by 2, while the number of tugs and passenger vessels has remained unchanged.

The system envisages the construction of dry cargo diesel vessels of 12 types from 200 to 5,000 tons and 4 tankers with a tonnage from 250 to 5,540 tons designed to be operated on the main waterways and small rivers of the European RSFSR, Siberia and the Far East.

Virtually all the cargo diesel vessels, with the exception of the smallest, will have increased strength making it possible to operate them in ice during an extended navigation season or in entering coastal maritime areas.

Without taking up the merits and shortcomings of each class included in the new cargo diesel vessel system, several comments must be made on its first section.

There are serious doubts as to the advisability of building a large number of cargo diesel vessels designed to transport dry cargo within the Unified Deep Water System without going into sea navigation areas. At present, a significant portion of the cargo diesel vessels must be employed in transporting bulk cargo within the river basins. Thus, within the VORP [Volga United River Shipping Company], these vessels carry salt, coal and mineral building materials on the lines within the basin. At the same time the cargo shipping costs on such vessels are approximately 30 percent higher than on the large-cargo pushed consists with a cargo capacity of 9,000-18,000 tons.

The technical and economic indicators for the operation of cargo diesel vessels are significantly improved in pushing nonself-propelled units: labor productivity for the crew is increased by 1.4-1.5-fold while shipping costs are reduced by 15-25 percent. However, the operating indicators of even the largest cargo diesel vessels with towed units are poorer than for the large-cargo consists. Thus, during the 1983 navigation season at the VORP, labor productivity for the crew on the sectional diesel cargo vessels of the class "XXVI s"yezd KPSS" and "Volgo-Don" with a barge with a total cargo capacity up to 10,000 tons was 40 percent less than on the large-cargo consists with a cargo capacity of 15,000-18,000 tons with tugs of 1,470 kilowatt power while cargo shipping costs were 25 percent higher.

Here it should be kept in mind that the cargo diesel vessels with attached barges have been operated on the most heavily loaded, long-run lines with a return load. The average run with cargo during a round-trip was 1,873 km for them while just 1,430 km for the towed consists. From this it follows that the plan for broadly employing cargo diesel vessels in the intrabasin shipping of bulk cargo is extremely debatable. It leads to a substantial deterioration in the technical and economic operating indicators of the fleet and to great additional monetary expenditures on shipping the cargo.

Also debatable is the advisability of building cargo diesel vessels with the same drafts of two types of the "II-SP" class: one with a cargo capacity of 4,000 tons and a second with 3,000 tons. In the aim of increasing the number of boats built in the series it would be advisable to limit oneself to just one of them.

For some reason the dry cargo-tanker diesel vessels have not been included in the first section of the system. At the same time the great possibility for loading these vessels in both directions of a route makes them very promising and we must not give up their actual use during the 11th Five-Year Plan. The existing Volga oil and ore carriers with a cargo capacity of 2,700 tons (Design 1570) have proven to be good, although they do require some modernization.

The tugs included in the system with a power from 330 to 1,760 kilowatts as well as the icebreakers and roaders basically conform to their purpose and their construction is indisputably essential. At the same time, as in the previous system, without justification no provision has been made for a powerful tug designed to pull large-cargo consists in the Volga-Kama Basin. For this basin it is essential to design and build a series of pusher tugs with a power of at least 1,760 kilowatts (2,400 hp) with a draft of 3-3.3 m, making it possible to have an optimum-diameter propeller and, consequently, significantly improved traction performance of the vessel. The full-scale trials conducted by the GIIVT [Gorkiy Scientific Research Institute for Water Transport] in 1982 showed that an increase in the power of the Design 428 tug from 1,470 kilowatts to 1,760 kilowatts (the new Design N3290), that is, by 20 percent, with the same draft would make it possible to increase the hawser traction alone by just 8.6 percent while the specific traction (related to 1 kilowatt of power) would be reduced by 11.2 percent. Thus an increase in power would lead basically to an increase in fuel and lubricants consumption while the traction qualities of the vessel would virtually not improve. Attention was drawn in the press (RECHNOY TRANSPORT, No 6, 1983, p 38) to the inadvisability of increasing the power of the tugs of the OT-2000 class in maintaining the same draft, however this warning was disregarded and the construction of the inefficient tugs has been legitimized by the system.

The development of a tug with a draft of at least 3 m would make it possible with the same power to increase the carrying capacity of the consists to 20,000-25,000 tons.

In our view, it is also wrong to set the power of the tug of the R153 design destined for the Volga-Kama Basin equal to 1,100 kilowatts. The 2 years of operating these vessels in the VORP have shown that their power is insufficient for handling four-section consists with a cargo capacity of 15,000 tons, while with consists with a cargo capacity of 7,500 and 9,000 tons, diesel vessels of the "Zelenodol'sk" and "Dunayskiy" with a power of 940-1,000 kilowatts operate excellently and the forming of consists with a cargo capacity of 12,000 tons (as is envisaged by the system) is possible only using barges of the R79 Design of which the VORP has an insufficient number.

For incomprehensible reasons, the system does not include transport tugs with a power of 110 and 220 kilowatts, although the demand for them for pulling consists with a cargo capacity of 1,000-2,000 tons over the small rivers is significant. The use of high-powered diesel vessels (330 kilowatts) instead of them leads to a deterioration in the technical and economic operating indicators of the fleet on the small rivers.

Finally, it must be considered that for roadstead work with large-tonnage barges it is essential to have tugs of 600-kilowatt power, since in windy weather the controllability of the tugs of 440-kilowatt power with sections and barges with a cargo capacity of 4,000-5,000 tons each is insufficient. As a consequence of this, in roadstead operations it is essential to use powerful transport tugs and this unconditionally is unacceptable.

The number of types of nonself-propelled vessels has been somewhat increased in the new system. There are plans to build such promising vessels as sections

with a cargo capacity of 4,650 tons of the R156 Design for two-line consists and bunker barges with a cargo capacity of 4,000 tons of the 81060 Design adapted for mechanized hydraulic unloading, as well as platform barges with a cargo capacity of 2,500 tons each for the rivers of Siberia. The nonself-propelled vessels of eight classes can be operated under icy conditions in an extended navigation season.

However, the system includes basically only nonself-propelled vessels of the barge type. An exception is only the sectional consist of the R156 Design and at the same time the advantages of sectional consists are well known. In comparison with barge consists, water resistance to them is 15-25 percent less, cargo capacity with the same basic dimensions is 8-12 percent greater and at the same time these advantages have not been taken into account. While for the Volga-Kama Basin they plan to build sections for consists of the R156 Design, barges are to be built only for the other basins. At the same time in the Siberian basins the consists of sections with a cargo capacity of 3,000 tons (Design R29) have proven very effective. However, these have not been included in the new system. Generally speaking, it does not have any large-tonnage vessels for construction to replace sections of the R29 Design and barges of the R56 Design, although the Ob-Irtysh United, West Siberian, Yenisey and Amur River Shipping Companies have a great need for nonself-propelled vessels of such tonnage. The developing situation puts the further development of large-cargo consists in jeopardy in these shipping companies.

In our opinion, it is essential to restrict the construction of Design R79 barges for the Volga and Kama Shipping Companies, as consists from these barges in terms of seaworthiness are inferior to consists of the R156 Design. There is a demand for a certain number of such barges, however during the 12th Five-Year Plan there will no longer be any need to supplement the nonself-propelled fleet with them.

The system does not make sufficient provision for nonself-propelled oil tanker vessels (just two types). Moreover, in terms of cargo carrying capacity (6,000 tons for the major rivers, obviously for the Volga and Kama and 1,000 tons for rivers with navigable depths of at least 1.6 m), they are significantly inferior to the existing barges. At the same time the transporting of oil cargo in pulled consists is 10-20 percent cheaper than in large tankers, as has been repeatedly shown by specialists from the Volgotanker Shipping Company. Regardless of this, the construction of nonself-propelled oil-transporting vessels is being curtailed and preference is being given to tankers.

Some of the designated shortcomings to some degree will be eliminated in the future, as the second section of the system includes new classes of vessels for designing and construction in a subsequent period. These include: a 4,000-ton tanker diesel vessel, a tug of 2,200-kilowatt power for the Volga and Kama, shallow-draft tugs of 220 and 110 kilowatt power, platform barges with a cargo capacity up to 5,000 tons for the Central Basin and up to 4,000 tons for the Siberian rivers, an oil barge with a cargo capacity of 3,000 tons for the Siberian rivers and a dry cargo-oil barge with a capacity of 600 tons for rivers with depths of at least 1.6 m. For the series building of the listed classes of vessels, significant time is required for working out the plans, construction, river trials and experimental operation of the head vessels. This means that

during the 12th Five-Year Plan the fleet will receive virtually no vessels of the future types. Consequently, the above-indicated shortcomings will influence the development and formation of the fleet for some time to come. This circumstance urgently requires the working out of additional ideas the implementation of which will make it possible to more rapidly fill out the river fleet with optimum vessels.

At first glance, the system of passenger vessels includes all the basic promising types of diesel vessels needed for transporting business passengers, tourists and excursionists as well as for suburban and intracity travel. However, the new system does not have any substantial differences from the previous one. Virtually the same passenger diesel vessels have been left in it for transit and local lines. An exception is the "Raketa" hydrofoil which will be replaced by the "Voskhod" hydrofoils (these were also in the previous system), the planing diesel vessel "Zarya" has also been excluded and in addition they plan to build only the "Orion" class air cushion vessels and passenger catamaran motorships of the R132 Design for 265 persons.

In the first section of the system, as before no solution has been provided to the long-pressing question of increasing hydrofoil speeds up to 90-100 km per hour. This is extremely essential to satisfying the demand for passenger hauling on lines over 400 km long. These vessels again have been included only in the second section which envisages their designing and construction in the undetermined future. This means that in the following five-year plan no further increase is envisaged in the speed of passenger vessels.

Of dubious effectiveness is the construction of a large series of tourist diesel vessels with a capacity of 332 passengers under the Design 302, since the high construction cost and running expenses lead to a situation where it is virtually impossible to provide profitable operation.

In this regard, in our opinion, it is essential to study the question of filling out the passenger fleet with simpler and cheaper vessels for mass tourist travel and to develop a special class of diesel vessel for these purposes.

It is correct to include in the system the catamaran diesel vessels for 182 persons (Design R104) for local lines and for 265 persons of the "Volga" class (Design R132) for suburban lines. These will replace the large series of worn out and obsolete vessels of the OM and MO class and in terms of their operating qualities they fully satisfy the needs of the passengers.

Also to be regretted is the fact that up to now they have not started series construction on the diesel vessels of Design R104, although the head vessel "Anatoliy Uglovskiy" was built back in 1975. As its operation has shown, this vessel is fully effective. They have been extremely slow also in building diesel vessels of the "Volga" class. Since 1980 just two vessels have been put into service. As a result, regardless of the fact that the question seems resolved in the system, the shipping companies are virtually not receiving any modern vessels for the local and suburban lines.

Thus, the new system of vessel classes as a whole is undoubtedly a step ahead, although in working it out a number of questions has remained unresolved and

the correctness of a portion of the decisions taken causes serious doubt. These shortcomings could have been avoided if the process of working out and revising the system had been better organized. Excessive hurry is inadmissible in solving such major questions.

At the same time, the time for drawing up the system of standard vessels, for example, by the GIIVT was limited to 1 year and of this period we were able to block out not more than 3 months for directly choosing and providing the feasibility studies for the vessel classes. All the remaining time was spent on coordinating questions related to this work with 18 (!) different organizations of the MRF and analyzing the comments of the latter. Considering that just four co-workers were engaged at the institute in compiling the system of passenger class vessels, one can judge how profoundly and thoroughly they succeeded in carrying out such important work. We feel that this work should have started not in 1982 ut significantly earlier. All the more as the previous system approved in 1976 had been compiled only for a period up to 1980.

The organization of the process of reviewing the draft system also evokes comment. Previously it was reviewed in the major navigation companies and in all the institutes and central design bureaus of the sector and at some of them an intermediate discussion was organized. Regardless of the fact that such a procedure undoubtedly would help increase the level of the decisions taken, in the given instance they departed from this. As a result, for example, a large collective of scientific workers from the GIIVT did not participate in the discussion, although valuable advice and comments could have been gained from this.

The shortcomings in organizing work on the choice and the feasibility studies of the standard vessels in the future should be eliminated. Let it be hoped that the specific comments on the system will be examined.

10272
CSO: 1829/33

AUTOMATED SEA TRAFFIC CONTROL SYSTEM IN NAKHODKA BAY

Moscow MORSKOY FLOT in Russian No 4, Apr 84 pp 28-30

[Article by Yu. Zurabov, chief of the division, and G. Moskvin, chief specialist (Morsvyaz' sputnik V/O [All-Union Association]): "The Ships Are Controlled From the Shore"]

[Text] The constant growth of intensiveness in ship traffic at approaches to ports brings about an increased risk of navigational accidents and disruption of the smooth work flow of the fleet and the ports due to idle times and delay in turning over the vessels for processing.

In crowded waters, particularly under conditions of limited visibility, there is no insurance of safety when sailing with the aid of only the vessel's technical navigational devices. This is precisely why active control of ship traffic from the shore has been put into wide-scale use.

Instead of ordinary ship radars, which were established initially on the shore to assist vessels and monitor their position in small port water areas, systems for Ship Traffic Control (UDS) began to be used. They are based on specialized shore radar stations (BRLS) and are able to ensure traffic regulation and radar guidance for vessels along the channels and waterways.

Automated UDS systems with BRLS remote control and transmission of the obtained data to the control center have appeared in the last few years, and a trend has also been noted toward wide-scale use of electronic computers to process the radar information. With the aid of an electronic computer, solutions can be found to the problems of determining coordinates, tracking the vessels, selecting the optimum routes for traffic, preventing dangerous situations, sytematizing and storing various data concerning vessels, etc. This makes it possible to reduce the number of operators and probability of subjective errors, which are inevitable with the diversity of problems arising in zone where there is high intensiveness of ship traffic.

One of the recent systems for this type of level is the automated UDS system in Nadhodka Bay, put into operation in 1981.

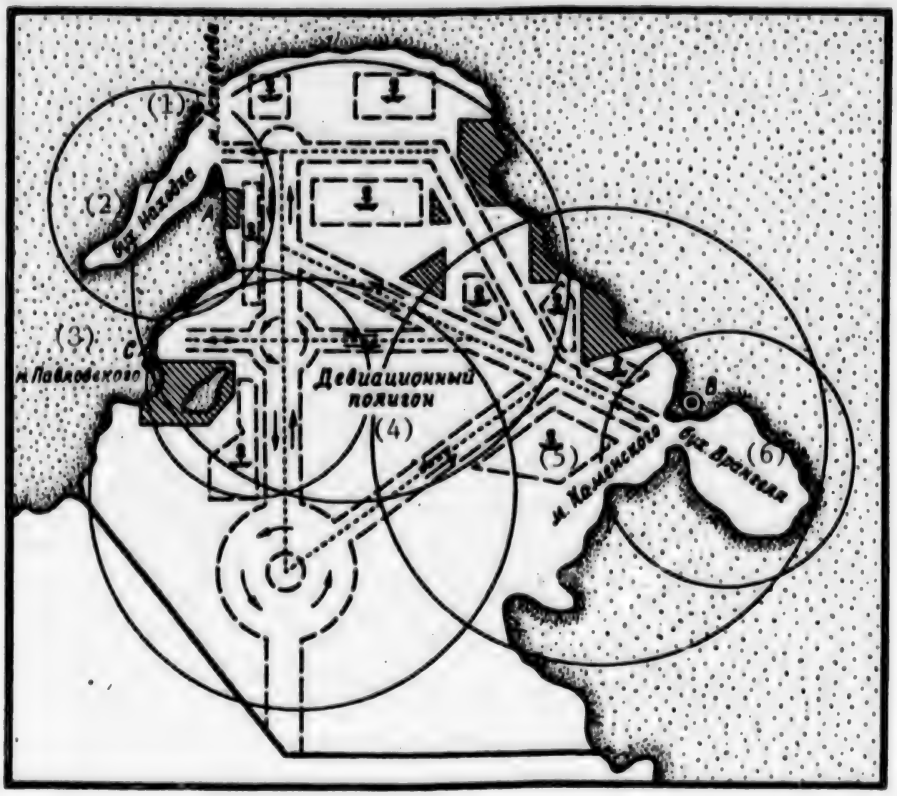

Diagram of Traffic in Nakhodka Bay, Depicted by an Electronic Chart, and Scanning Zones, Divided into Radar Indicators and Graphic Displays.

B--central station, A and C--unattended stations. The heavy solid line indicates the boundary of the computer processing zone. The shaded sections--the danger zones; the dotted lines--the axes of the navigable channels; the boundaries of the navigable channels and anchorages are indicated by the hatchings.

Key:

1. Nakhodka Bay
2. Cape Astafyev
3. Cape Pavlovskiy
4. Deviation Range
5. Cape Kamenskiy
6. Wrangel Bay

Great economic importance is given to development of the freight turnover of the ports located in Nakhodka Bay. The new Vostochnyy [Eastern] Port has been developed here, which after completion of the construction will become the largest in the country. Also located in the bay are a fishing port and maritime trade port for Nakhodka, as well as a bulk oil port. The outlet of the Baykal-Amur main railroad line is here, and this region is therefore

becoming an extremely important junction point for domestic and international freight transshipment. In addition to an increase in the intensiveness of the navigation, the sailing conditions in Nakhodka Bay are complicated due to the dense fogs (up to 180 days a year), snowfall and rains, storms and ice covering of the port water area.

All this has determined the decision to create an automated UDS system here, using modern radar-computer apparatus and the newest methods of solving the problems of navigation on the basis of the latest achievements of science and technology.

In order for radar observation to encompass the approach routes, the bay's water area and the adjacent bays, three equipped radar stations have been established on the shore area of the bay. One of them is the center of control, and is positioned at Cape Kamenskiy at the entrance to the Eastern Port. The two other stations (unmanned) are located at Astafyev and Pavlovskiy capes near the bulk oil and Nakhodka ports.

With the aid of three BRLS, distinguished by high precision, resolution capacity anti-interference features and reliability, a collection of radar information is made here, which makes it possible to determine the position of objects in the bay's approach zone and in its port water area, including buoys and small vessels.

Information from the unmanned BRLS is translated to the center via radio relay lines, where at the radar indicators both the general conditions for the entire port water area and the conditions for any of the eight individual zones are depicted. At the same time, the radar screens show the natural radar signals ("raw" depiction) against the background of the man-made video-chart in the form of points indicating the navigable channels, anchorages, deviation range and danger zones. Therefore, the chart-diagram of the port water area and the radar marks are jointly combined and are depicted electronically.

This representation of the situation is in itself sufficient to ensure the functions for controlling the vessel traffic: in a number of UDS systems it is limited to this. However, in systems serving a port water area with intensive traffic, the problem arises of reducing the number of operators and of facilitating their work connected with continuous observation of the situation on the radar screen and processing the data manually.

With respect to this, in the UDS system in Nakhodka Bay, the operators make only a qualitative evaluation of the situation and determine the possible variants of the decision, while their limited possibilities for a rapid quantitative evaluation of the situation and the different variants of the decisions are entrusted to the electronic computer.

For this purpose, the radar signals arriving from all three BRLS are initially transformed into digital form, convenient for computer processing. After the transformation and filtration of the interference, the information separated out arrives at the central computer, which synthesizes the entire situation, and it is depicted on a wall screen measuring 3 X 3.5 meters.

The diagram of the traffic and every other situation in the bay's water area is plotted graphically on the screen. The field of the screen, corresponding to the water surface, is made up by light-emitting diodes (20,000 units). Each radar signal is depicted on the screen by a lighted point in the position corresponding to it.

The algorithms for solving problems with the aid of an electronic computer are constructed so that the system issues signals to the operator concerning a disturbance in the assigned traffic system specified by the rules of navigation, for example, when there is a deviation from the permissible rates of speed, digression from the assigned course, a dangerous situation of close approach, a vessel's drifting from the official anchorage, violation of the traffic system, appearance of a new vessel in the processing zone and violation of the arrangement of navigational safety devices. Therefore, the electronic computer of the system operates as if "on its own", and from the wall screen the operator obtains information on the specific spot in which a situation has arisen that requires his intervention. The operator gives notification of this by a sound signal which is accompanied by flashing of a signal panel with the inscription ATTENTION or ALARM. At the same time he sees the flashing of the light-emitting diodes indicating the position of the "violating" vessels or vessels subject to danger.

The operator is further faced with the problem of determining what has happened and to which specific ship, after which he should give the necessary information or indication to the corresponding vessel. For this he has at his disposal working displays of graphic and textual information on which detailed data come from the electronic computer to specify the situation and determine the measures necessary to reinstate the normal situation. On the working graphic displays, in contrast to the radar screens, a sharp image is reproduced, normally perceptible in daylight. It also contains a chart with the traffic diagram in the form of electronic lines. The vessels are depicted by symbols, the shape and size of which correspond to specific categories and dimensions of the vessels. There are three forms of symbols: a square--unidentified vessel, triangle--identified vessel and circle--vessel at anchor or at a berth. The symbols can have three sizes: small, when the vessel's measurements are up to 50 meters, medium--from 50 to 150 meters and large--over 150 meters. If the vessel is moving, the symbol has the speed vector.

When the signal "ATTENTION" or "ALARM" is received from the wall screen and the zone where the corresponding vessel is located is determined from the wave-beam guide flashing, the operator observes the symbol belonging to this vessel flashing on the working display. Since, along with the symbol, the number given it lights up, the operator turns to the electronic computer, which informs him what vessel this is, and for what reason the alarm has been given. This information is received on a colored text display of the television type. If there is a dangerous situation, the information on the textual display is issued automatically, without a request from the operator and is shown in red text to attract attention. For example, if there is a danger of a collision, the display indicates the names of the vessels, the

distance between them and the time of their shortest approach to each other. In this case the operator can immediately obtain and issue the necessary information to the vessels on the specific situation forming in their locational zone.

A basically new technical solution in the UDS system at Nakhodka Bay is the combined (tertiary) processing of radar information in a central computer. Data preliminarily processed from all three BRLS are analyzed, correlated and averaged. In this way, shortages of information obtained from one of the BRLS are compensated for by the other two, and this increases the system's interference-suppressing. For example, when processing radar signals obtained after a survey of the various directions of the vessel from the three points at which the BRLS are located, the electronic computer issues more reliable information on the vessel's position, course and speed. In addition, according to the results of the combined processing, the vessels are automatically classified according to size into large, medium and small, and they are given the corresponding symbols which were mentioned above.

Three operator panels are placed in the center of the control system, in addition to the wall screen. Each panel has one radar indicator and three graphic displays for a synthesized picture, of which one is operative and two auxiliary, duplicating the situation with displays from the adjacent panels, as well as one textual display.

When a vessel enters the service zone, the servicing system automatically "catches" it and produces all the types of radar information processing. The operator identifies the vessel with the aid of UKV [ultra-short wave] radio communications. Upon his command, the electronic computer combines the radar information on the vessel with the dispatcher information preliminarily introduced into the computer, which includes the name, national classification, designated port, time of arrival (departure) and size of the vessel, type of cargo, anchorage place, etc. After that, any information on the vessel, including the course, speed and data on evaluation of the danger, can be called up on the textual display. When necessary it is also possible to call up the computer-formulated table data for all vessels or separately according to the groups of vessels in specific ports or at anchorages.

Graphic and textual information on vessels and their position can also be summoned up by remote control and on the read-out display placed at individual offices of the shipping company and the ports.

The system specifies full documentation of the information: all the conversations between the operators and the vessels are tape-recorded; the radar image for a given program is automatically photographed from a special screen; in addition, all the graphic and textual information processed by the computer is retained in the machine's memory and can be reproduced when necessary.

The technical equipment of the UDS system at Nakhodka Bay makes it possible to automate the fulfillment of the following basic functions: observation, monitoring and regulation of navigation in the water area of the bay; monitoring the position of the vessels at anchorages and the navigational equipment

devices; radar remote guidance for the vessels; prevention of emergency situations; transmitting efficient navigational information to the vessels; communications between the vessels and the shore services and coordination of their actions with respect to regulating ship traffic.

The efficiency of the UDS system in Nakhodka Bay has been clearly shown during its operation time. The system yearly monitors the movement of over 33,000 vessels. It has helped to detect the dangerous drifting of 17 vessels and taken measures to ensure their safety, and has also rendered assistance to one vessel, the engine of which broke down at the approach to the bay. In addition, a considerable number of violations of the rules of sailing and radio communication have been averted, including 31 cases of vessels' going out against the traffic flow and 17 cases of speeding. Introduction of the system made it possible to improve the use of ultra-short wave radio communication channels to ensure safety and organization of navigation and increase the smooth flow of sending vessels for processing due to efficient transmission of information, early preparation of the vessels for the start of traffic and pilotless conducting to the port water areas, especially under unfavorable weather conditions, when it is difficult for the pilot to go out to the outer roads. According to the calculations of TsNIIMF [Central Scientific Research Institute of the Maritime Fleet], the total amount of time saved in a year is about 5000 ship-hours.

In 1983, instead of the existing provisional Navigation Rules, there were issued, in accordance with all the interested departments, the Rules for Navigation of Ships and Vessels in Nakhodka Bay, and a special tariff notification was issued on establishing the fee for serving vessels with the UDS system, in consideration of the qualitatively new type of services, as compared with the BRLS in effect at other ports.

Introduction of the automated UDS system in Nakhodka Bay and the experience accumulated in the process of its operation made it possible to reveal and study a number of problems related to the use of similar systems and determine additional potentials and limitations in using electronic computers to process radar and dispatcher information. The research carried out on the basis of technical devices and methods put into practice in the UDS systems in Nakhodka Bay and at the port of Il'ichevsk, where remote transmission and data processing are also used with the aid of electronic computers, formed the basis for developing new apparatus to equip with it the regions of the USSR with high intensiveness of ship traffic, such as Kola Bay, the Straits of Kerch, the northwestern area of the Black Sea, the ports of Leningrad, Vladivostok and others. Development of these systems is one of the basic tasks of the Morsvyaz'sputnik V/O, to ensure navigation safety.

12151
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'ORION' AIR CUSHION VESSEL RESEARCH OUTLINED

Moscow RECHNOY TRANSPORT in Russian No 7, Jul 84 pp 29-30

[Article by Candidate of Technical Sciences A. Kesler of the GIIVT [Gorkiy Institute of Water Transport Engineers]: "Air Cushion Vessels: Prospects for Improvements"]

[Text] Along with generalizing the experience of the technical operations of passenger skeg air cushion vessels (ACV) of the "Orion" class, the GIIVT [Gorkiy Institute of Water Transport Engineers] with the participation of the Vympel [Pennant] TsKB [Central Design Bureau] have investigated the possibility of increasing the effective lift system of this class vessels as the system determines a majority of their navigational qualities. In recent years a number of interesting ideas has been proposed. One of them has been tested out on the "Orion" class ACV during the 1982 and 1983 navigation seasons.

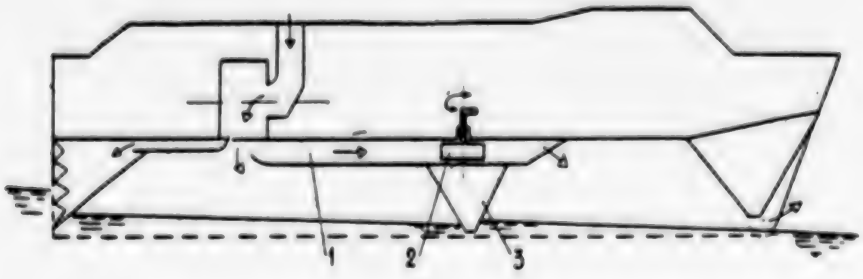

Diagram of Experimental Lifting System
of Skeg Air Cushion Vessels

The aim of the experiment was to show the possibilities and advisability of controlling the ship's trim using the air cushion. For this, between the skegs of the diesel vessel "Orion-2" (see the diagram) a flexible sectioning curtain 3 was installed while a baffle 2 was installed in the air distribution duct 1 for throttling the air flow moving from the stern to the bow sections.

The trials were carried out on the Vyatka River close to the port of Vyatskiye Polyany with the regular (design) and experimental designs of the lifting system and two variations for loading the vessel: in ballast and fully loaded.

In the experimental system the degree of opening the air ducts remained fixed during the accelerating and full-speed periods. The possibility of controlling the air current under the bottom with the regular system was not envisaged. The hovering of the craft in place ("stop") was provided by resetting the reverse flaps.

The table [on the following page] gives the average of the trials. The radius of the turning circle was defined as the average value from the results of measuring it in turning at full speed to port and starboard, with the current and against the current. The rudders were reset to an angle of 30°. In all instances the turning speed of the engine shaft was 1,400 minutes^{-1} (with a nominal speed of 1,500 minutes^{-1}).

From a comparison of the trial results for the empty vessel it follows that by changing the pressure differences between the stern and bow air cushion sections, the extreme draft in hovering in place was reduced from 0.64 to 0.57 m (by 11 percent), and at full speed from 0.66 to 0.49 m (by 26 percent); simultaneously the radius of the turning circle declined from 169 to 126 m (by 25 percent) while running speed rose by 2.3 km per hour.

With the vessel fully loaded, the employment of the experimental system made it possible to reduce the extreme draft in motion from 0.73 to 0.6 m (by 18 percent) and this obviously was the reason for the reduction in the radius of the turning circle from 182 to 142 m (by 20 percent). At the same time, with a full load an insignificant reduction in speed was noticed.

During the period of the trials with the experimental lifting system the diesel vessel repeatedly ran through at full speed waves from passing vessels without interrupting its operation. No other negative phenomena were noted.

The results of the trials, in showing the advisability of utilizing the air cushion for adjusting the trim did not provide, however, a full notion of the possibilities of employing the proposed system for increasing the navigational qualities of the skeg ACV. This is explained by the fact that on the "Orion-2" ACV it was not possible to fully realize the experimental lifting system. In particular, in addition to the duct for shifting air from the stern section to the bow, there were plans to install a duct for releasing air from the latter into the atmosphere and this would make it possible to alter the air pressure in the bow section to the required amount regardless of its pressure in the stern section. As calculations showed, in this manner the navigational draft of the "Orion" class vessel in hovering in place, moving at a slow speed or maneuvering, could be reduced to 0.35 m, that is, by approximately 2-fold in comparison with the draft of the operated diesel vessels.

The proposed device provides an opportunity to stabilize the air cushion movement with a significant chop. In this instance using the device a large portion of the air can be directed into the bow section, that is, where its greatest consumption is observed. Such an adjustment makes it possible, on the one hand, to prevent a pressure air drop in the bow section of the cushion and the "nosing under" of the vessel and on the other, to prevent increased pressure in the stern section and the coming out of the water of the stern. This, as the operating of skeg vessels shows, often leads to the exposure of the intakes of the water jets and the getting of air into them (the loss of suction).

a) Параметры	b) Судно порожнем		c) Судно в полном грузу								
	d) штатная схема		e) Экспериментальная схема								Штатная схема (d
			Канал открыт f		Канал закрыт g		Канал открыт f		Канал закрыт g		
	h стоп	i ход	стоп	h i ход	стоп	h i ход	h стоп	i ход	стоп	h i ход	i ход
j) Избыточное давление в секциях воздушной подушки, кПа:											
k) носовой	1,42	1,37	1,31	0,98	1,18	0,25	1,65	1,06	1,57	0,31	2,08
l) кормовой	2,48	2,21	2,1	2,35	2,16	2,45	2,42	2,7	2,45	2,8	2,54
Скорость хода, км/ч (m	—	46,2	—	47,5	—	48,5	—	44,6	—	42,8	45,2
Осадка, м (n											
k) носом	0,02	−0,07	0,03	−0,03	0,03	0,02	0,05	−0,05	0,06	0,03	−0,07
o) наибольшая	0,64	0,66	0,7	0,63	0,57	0,49	0,74	0,69	0,69	0,6	0,73
Радиус циркуляции, м (p	—	169	—	—	—	126	—	—	—	142	182

Key: a--Parameters
b--Empty vessel
c--Fully loaded vessel
d--Regular system
e--Experimental system
f--Duct open
g--Duct closed
h--Stop
i--Run
j--Overpressure in air cushion sections, kilopascals
k--Bow
l--Stern
m--Running speed, km/hour
n--Draft, m
o--Greatest
p--Radius of turning circle, m

Calculations show that by using the proposed device the trim of a skeg vessel can be altered widely.

The research performed can serve as the basis for modernizing the lifting system of an "Orion" class diesel vessel. The next step in this direction should be the working out of an experimental device and its installation on one of the vessels under construction.

The operating experience of the "Orion" series ACV makes it possible to make certain conclusions and proposals on improving the flexible air cushion skirt. As a whole, it can be stated that the skirts dependably hold the air under the bottom under various conditions and provide the designed vessel draft.

At the same time, there have been complaints about low-frequency oscillations of the vessel's bow in moving at full speed with waves 0.15-0.25 m high. This occurs as a consequence of the instability of the process of air leaking from under the nose skirt. There has been information that a similar phenomenon is also observed on foreign skeg ACV. However, it would be wrong to feel that this shortcoming cannot be eliminated as the technical ideas around this must be worked out.

Characteristic damages to the bow skirt are the separating of the material and rips which spread from the lower edge of the sections. In 1,600-1,800 running hours the sections are worn down by an average of 15 cm in length and after this they must be replaced with new ones although the worn out part does not exceed 20 percent of the area. Subsequently, the old skirts, as a rule, are not employed and this leads to the ineffective use of the material. In this regard, it would be advisable to alter the design of the bow skirt providing for an easily changeable lower part for it.

On the skeg vessels the stern skirt undergoes intense dynamic stress. On the "Orion" ACV they have adopted a skirt of the "accordion" type consisting of a multilayered flexible material with a sufficiently dependable design being proposed by the author of the plans. Its life exceeds 3,000 hours. At the same time, in our view, there are opportunities to further improve the stern skirt. In particular, attention should be given to the proposal of incorporating into the design a rigid metal section which, in acting as an unique screen, would protect the material of the flexible part of the skirt from dynamic effects of the water and floating objects.

In recent years knowledge and experience in the area of developing and operating air cushion vessels have been noticeably enriched. These should be fully utilized in the further research and designing of skeg air cushion vessels.

10272
CSO: 1829/33

ZHDANOV YARDS TO BEGIN WORK ON IMPROVED RO-RO PROJECT

Leningrad LENINGRADSKAYA PRAVDA in Russian 14 Aug 84 p 4

/Article by Yu. Stvolinskiy: "Up to Now without a Name"/

> /Text/ Ships with the horizontal method of loading--the "ro-ro" (they are still called rolling because the cargoes are rolled in and rolled out) began to appear relatively recently, but they have already come to occupy an important place on the blue roadways of this planet. They are convenient for cargo operations, fast, and economical.

In the Baltsudoproyekt TsKB [Central Design Bureau] they showed me reports on the rollers designed in this bureau and built for several years now at the Plant imeni A. A. Zhdanov. Let's take any one at random. The Far Eastern Shipping Company notes the following: "The Gavriil Kirdishchev, a ship of the 'ro-ro' type, has operated successfully since 1977 under complex hydro-meteorological conditions, on various routes, and with the most diverse cargoes in the regions of the Far East and Southeast Asia. This diesel ship showed high operating qualities." The Baltic Shipping Company states: "The diesel ship Ivan Derbenev began operating in August of 1978. This ship possesses good seagoing qualities under any weather conditions."

Other reports are in the same vein. They all testify to the fact that ships of the Ivan Skuridin type and modernized "ro-ro" ships of the Anniversary of the USSR type have proved to be successful. But we must not forget that the Skuridin design was created in the late 1960's; shipbuilding technology is constantly moving on, and we already need other "ro-ro" types, capable of carrying out a wider range of tasks and more economical. A design for a new ship has been created at the Baltsudoproyekt TsKB, and preparations for construction are underway at the Plant imeni A. A. Zhdanov. By the way, with regard to displacement, these vessels will be the largest of any built by this enterprise's shipwrights.

In a conversation with a correspondent of LENINGRADSKAYA PRAVDA, the chief designer and winner of the USSR Council of Ministers Prize, candidate of technical sciences Vadim Aleksandrovich Matskevich stated the following:

"We strove to create a ship which would meet the most up-to-date requirements for hauling containers and wheeled equipment of various types. It has been calculated that outlays on delivering one ton of cargo, as compared with the diesel

ship 60th Anniversary of the USSR, will be reduced by 10 percent on an average. Hauling capacity will be 45 percent higher, and fuel expenditure will be reduced by 15 percent in comparison with ships of the Ivan Skuridin type."

All this has been achieved primarily by means of enlarging the ship itself. Displacement of the new "ro-ro" is 21,260 tons. The twin diesels, manufactured by the Bryansk Plant, will allow this ship to develop a speed of as much as 17.5 knots. The total area of the cargo space amounts to as much as 24,000 cubic meters. On ships hauling passenger cars, trucks, busses, and road equipment with prime engines the problems of ventilation and fire-fighting measures become particularly urgent. On the new "ro-ro" (which is still without a name) provisions have been made for a 10-fold change of air in the ship's quarters while sailing and a 20-fold exchange while standing.

The design has paid maximum attention to the problems of navigational safety. This ship will have transverse bulkheads with large "openings"--"gates" for machines and roll-trailers to pass through. After the loading operation these "gates" are closed, thus ensuring the water-proof quality of the bulkheads. An extremely important measure for increasing the ship's viability is the double bottom and double sides, which are raised considerably above the waterline.

The designers have attempted to increase the productivity of loading to the maximum degree possible. With this goal in mind, they abandoned the bow access ramp and arranged the engine room so as to make it possible to put the ramp in the stern. The main deck, on which the cargoes will be moved, is to be located directly over the engine room. Moving the cargoes around inside the ship will be done in a combination-type manner. Transferring any equipment from the main deck to the upper deck will be accomplished by a hoist with a lifting capacity of 70 tons. Moving items from the main deck to the lower deck will be accomplished by means of a ramp for machines and wheeled equipment. The stern apparatus is of the slewing type, 34 meters long, and designed for double-row movement. Its cargo-hoisting capacity is 120 tons.

Such vessels, which operate on a tight traffic schedule, need to have a high degree of maneuverability within their moorings. They need to be assured that they will not lose literally a single minute. At the same time the "ro-ro's" are high-sided ships with a great deal of "sail," and to moor them, let's say, when there is a "pressing" wind is not such a simple matter. The pilots are to be aided in the struggle for time primarily by a twin-shafted power plant--with twin screws, which, furthermore, will have a controllable pitch; these elements will make it easier to carry out maneuvering; moreover, quite a heavy-duty "taxiing" apparatus has been provided.

In conjunction with the plant, the designers have solved the problems of the technical aspects of the hull, superstructures, and the engine room. Everything possible will be assembled in the workshops. The sections, already filled to the maximum with systems, apparatus, and equipment, will be moved to the building slip.

The sailing range of the new ship will be 12,000 miles. This "ro-ro" will cope with the ice floes of the Gulf of Finland without the help of an icebreaker.

Lengthy passages and brief stays in ports require that the level of everyday conditions on board ship be upgraded. All the members of the crew are housed in single-type cabins. The officers have a ward-room and a salon, while the crew has a mess-hall and a salon. Nor have a sauna, baths, a swimming pool, and a gym been forgotten.

With regard to its design this new "ro-ro" is up to the level of the best present-day vessels of this class.

The group at the Baltsudoproyekt is now issuing the working drawings of the new ship.

2384
CSO: 1829/28

PRODUCTION IMPROVEMENTS AT NEVSKIY SHIPYARDS

Leningrad LENINGRADSKAYA PRAVDA in Russian 22 Aug 84 p 1

/Article by N. Kudryashov: "Ships on a Conveyor"/

/Text/ It seemed like just yesterday that at the dock of the Nevskiy Shipyard there used to be standing, as a rule, only one diesel ship, on which rush-type, finishing operations would be proceeding. Today the following five vessels were being built here: the dry-cargo freighter "Nevskiy-23," a pusher-tug, a dredge, a floating crane, and a passenger diesel ship.... And on each one well-planned work was proceeding apace. Within a month or two they will be sailing out to sea. But you do not notice, as was the case before, people scurrying up and down the decks. The basic volume of the operations is now carried out in workshops, in sections--under a reliable roof. And whole sections, units, and complexes are delivered here almost completely ready for installation. The fitters merely have to install them in the proper places. Of course, the building of a new ship still does not end with this. There are welders, acetylene-torch metal-cutters, carpenters, glaziers, and other skilled workers. Only one thing is lacking--the pre-delivery rush-work. Everything is proceeding, I repeat, in a well-planned manner, as if on a well-adjusted conveyor.

"We simply cannot work in any other way nowadays," stated the shipyard's chief technologist, Yu. Bobrikov, "the production volumes are increasing very rapidly. In addition to building dry-cargo freighters of the "Nevskiy" type, there has been a significant increase in the number of pusher-tugs, the production of which was first mastered in this country by the shipwrights of the Peter and Paul Fortress.

When you talk with the workers and production chiefs, when you look over the renovated workshops, units, and lines, you become convinced of the correctness of that technical policy which is being carried out in a well-planned manner, with thoughts for the future. The pre-planned measures are being introduced in advance of the intended deadlines, and they have been achieved so that they might operate more quickly on the state plan.

A. A. Bessol'tsev, the chief of the 15th workshop, where a modernization of the entire machine-tool inventory is going on, told us about an interesting case. In due course this workshop was assigned the task of manufacturing an apparently simple, at first glance, but extremely labor-consuming design of a complex configuration. The machine-tool operators cudgeled their brains for a long time over this order; they twisted and turned the blueprints this way and that way and... finally abandoned the project: on the existing machine tools, they said, such a product cannot be made.

They sent the blueprints off to one of the Leningrad plants, but the people there set such deadlines and payments that the shipwrights were literally aghast. Now this wretched design is being splendidly done by they themselves. And its serial production is being handled not by the senior workshops but rather by the most recent graduates of the shipyard's vocational-technical school. To be sure, they are finishing the items off on a new horizontal-milling machine tool.

This is only one of the present up-to-date units. In operation along with it are 20 machine tools with numerical program control. And each of them was put into production considerably earlier than had been proposed by the plan of organizational-technical measures. And so the economic effect of them has also already been felt at the present time. Nearing the stage of operation are five more units with numerical program control and a machine of the "processing center" type, six robots, and manipulators. The mechanical workshop is becoming crowded within its old walls.

Prior to the end of the five-year plan seven mechanized sections will be set up on the principal production line, in the mechanical workshops, and in the consumer goods workshop.

By the way, the Nevskiy Shipyard is the basic center for repairing not only vessels of the Northwestern River Shipping Company but also those of the entire ministry. It is here that they have discovered second life for the engines of the most diverse vessels which have run through their service life. In order to ensure their rapid and high-quality repair, a section for restoring parts was set up last year. Its specialists prepare the latest technologies for restorative operations, instruct the workers, and exercise monitoring controls over the introduction of innovations. As a result, they managed to set up production lines for the plasma spray coating and chrome plating of parts several months ahead of the intended time. Now such methods are being used for the restoration (rather than for manufacturing anew!) cylinder bushings, shafts, piston lifters, bearing covers, and many many other things. The production cost of restoring these parts by the method of plasma spray coating amounts to a total of only 10 percent of the outlays for manufacturing new ones. There are savings on metal, labor resources, and electric power.

The technologists are searching out new reserves. And not without success. A method is now being worked out for air spray coating with the use of ordinary welding wire instead of expensive powders and inert gases--helium and hydrogen. The new method has already been utilized to splendid advantage in restoring several types of parts.

Under the observation of the RSFSR Registry of the River Fleet this shipyard is conducting stand-type testing of engines in which lifters, sleeves, and other parts restored by skilled workers have been used. The unit is operating without a hitch.

An object of particular pride is the plant's information-computer center. It is headed up by the 28-year-old engineer M.Kuprin, a recent graduate of the Volgograd Polytechnical Institute.

This center began with a bureau servicing the old-fashioned Minsk-32 computer. Now in operation are the most up-to-date machines, possessing very extensive

capabilities. A system of automatic technological provisions for building ships is being mastered. It encompasses all phases of creating diesel ships. one of the most complex operations in connection with this comprises the adjustment operations. With regard to labor consumption they constitute as much as 20 percent! The computer has reduced the adjustment of the hull parts to a minimum. Now at the center they are beginning to install a system for tele-processing the information being given out over the communications channels. This will allow for a still greater expansion of the system's technical capabilities.

Meanwhile, the shipwrights of the Peter and Paul Fortress are developing ever-newer ideas. Having thoroughly analyzed the progress being made in carrying out the plans of the organizational-technical measures, in support of the call made by the shipbuilders of the Baltic Yard, they adopted counter-pledges. One of the main ones is the point providing for the introduction of advanced processes and more improved working devices, ensuring the fulfillment of the 11th Five-Year Plan ahead of schedule--by the time of the 68th Anniversary of the Great October Revolution.

Here is what A. V. Vodolazov, the shipyard's partkom secretary, said in this regard:

"Among the chief successes attained by our group one may single out three effective measures directed at improving production. These are consistent technical progress, political-educational work, and socialist competition, which speeds up the solution of the most complex problems. Here are just a few results of the past half-year. Labor productivity grew by 107.3 percent, while production costs declined by 0.6 percent. The brigade form of labor has encompassed 72 percent of the workers. The leaders in the socialist competition are those groups which are headed up by the Communists Ivan Petrovich Safronov, Aleksandr Mikhaylovich Melekh, Mikhail Nikolayevich Chernayevskiy, Viktor Leonidovich Potapov, and others. In seeking out internal reserves for intensifying production, we constantly rely on activists, on people. Because, of course, in the final analysis, the success of our common cause depends upon their conscientious labor and their awareness. And the wind of time, speaking figuratively, is blowing in our sails today."

2384
CSO: 1829/28

AUTOMATED SHIP NAVIGATING SYSTEM NOMINATED FOR STATE PRIZE

Moscow IZVESTIYA in Russian 23 Aug 84 p 2

[Article by A. Tret'yak, deputy chief of the Black Sea Shipping Company, hero of socialist labor; Professor G. Yermolayev, director of the Navigation Department of Odessa Higher Engineering and Maritime School; and Ya. Kvasnitskiy, senior engineer of the port of Ilichevsk vessel traffic control service, in the column "In Competition for USSR State Prize": "Automated Safety System"]

[Text] Work connected with creation and adoption of the first domestic systems of automated vessel guidance has been nominated to compete for the USSR State Prize. One of the systems, the Briz-1609-UDS automated shore radar system for controlling vessel traffic, after some modification, now has been in use for 3 years in the port of Ilichevsk. It provides monitoring of vessel traffic in the approach zone to the ports of Odessa, Ilichevsk and Yuzhnyy, as well as of vessels proceeding to Nikolayev and Kherson.

It is difficult to overestimate the significance of new systems which provide for the safety of navigation. Total freight turnover of the ports in the northwestern part of the Black Sea exceeds 50 million tons per annum, and navigation is highly intense in this region. Suffice it to say that 30 to 40 cargo carrying vessels are underway at any one moment. Quite a few foreign vessels sail here also, needing recommendations for safe navigation to an even greater extent.

The Briz-1609-UDS system, providing continuous monitoring of the carrying out of international rules of navigation [international rules of the road], is an effective means of discovering violations of navigational procedure, and provides for immediate intervention of the coastal services. In a certain sense, one may draw an analogy with the systems controlling air traffic. However, control of transportation at sea has its own peculiarities. These are limited traffic space--channel width--and the great sluggishness [slow response to the helm] of a vessel.

What are the principal differences of the Briz-1609-UDS system from ordinary radar stations? There are quite a few. The system permits making automatic and manual inputs of coordinates of detected vessels into the EVM [electronic computer] for their further tracking and monitoring. It computes the courses and speeds of vessels being tracked, and displays them on a screen in vector

and digital form. Charts of the approach zone to the ports of Ilichevsk, Odessa and Yuzhnyy are shown on the indicator screen. The capability of the system to detect a vessel which has violated the movement procedure prescribed by the rules of navigation is very important. The automatic system also permits timely determination of the risk of collision for two meeting vessels.

Use of the Briz-1609-UDS system permitted accomplishment, in 1981 and 1982, of the safe guidance of more than 24,000 vessels into the ports of Ilichevsk, Yuzhnyy and Odessa and toward the ports of Nikolayev and Kherson. About 2,000 vessels were guided in fog, and over 400 were guided without a pilot on board. In the process, the consequences of about 500 violations were prevented. Effective and unbiased monitoring of adherence to navigational procedure led to a significant reduction in the number of violations.

Accumulated work experience with the new system of controlling vessel traffic has permitted doing without mandatory pilot guidance of Soviet vessels up to Berezan Island. In result, the quality of pilot service has improved in the most important sector--the Bug-Dnepr-Liman Canal. The economic effect due to using the Briz-1609-UDS system in the northwestern part of the Black Sea exceeds a million rubles per annum.

The merits of the new vessel traffic control system give every reason to consider its authors deserving of the USSR State Prize.

12319
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NEW INLAND WATERWAY NAVIGATING SAFETY REGULATIONS

Moscow VODNYY TRANSPORT in Russian 29 Sep 84 p 3

[Article by M. Filatov, secretary of the commission on working out the rules, leading engineer of the Ministry of the River Fleet's Shipping Safety Main Inspectorate: "For the Safety of Navigation"]

[Text] New rules of navigation and accident prevention are being introduced in river transport

The need to rework the rules of navigation on RSFSR inland waterways arose long ago. At the start of the 1970's, in connection with the increase in numbers and speeds of vessels, their equipping with modern instruments, and development of the navigator method of navigation, the rules began to be modified. And now, supplementary rules will become effective as of 15 March next year.

Here a new section, "Navigation of Vessels in Limited Visibility", is introduced in place of the instruction on use of RLS [radar]. In it are defined the conditions and procedures for the movement, parting and overtaking of vessels. These rules, in combination with others ("Observations", "Safe Speed", "Preventing an Accident Situation"), will permit more effective use of the technical means of navigation (RLS, UKV [UHF], compasses, echo sounder [fathometer] and other instruments). This is aimed at reducing the accident rate and increasing the cargo carrying capability of the fleet.

In the section "Lights and Symbols [Shapes] for Vessels and Rafts", primary attention is paid to a more optimal placement of navigating lights, especially on towing and pusher tugs, in uniformity with MPPSS-72 [expansion unknown] (Running Lights, Bow Aspect). In result of this, the number of combinations of light placements is reduced (the bow aspect on a single vessel from five to two, on towing and pusher tugs from six to two).

This bringing into line, along with reducing a significant number of lanterns, lamps, electrical devices, cables and equipment, eases the work of navigators, especially those of mixed navigation [inland waterways and high seas], relieving them of the need to remember a large number of combinations of navigating lights.

A section has appeared in the new publication for sectors of the inland waterways with the cardinal system of navigational aids (Lakes Baykal, Onega and Ladoga), since the rules of 1963 do not regulate navigating and maneuvering in these sectors. Local rules, being published in the basins, although they do this, do not do it comprehensively and uniformly, something that occasionally leads to unclarity and contradictions in application of the rules.

In order to avoid duplicating rules of operation and regulations of service and discipline, the Instructions for Maintaining Navigable Conditions on Inland Waterways include only those provisions which directly regulate vessel movement, maneuvering and stopping, the display while doing so of signal lights and symbols, and the making of visual and sound signals.

Equipping of towing and pusher tugs with a newly introduced yellow light, instead of several colored fantail [stern] lights, is intended to be carried out in the course of 5 years, and changing the white fantail lights to lights with a 135 degree [12 point] arc of illumination in 10 years.

In an appendix to the new rules of navigation are given, as reference material, minimal allowances of water under vessel bottom in unrestricted rivers, canals and locks, allowances for length and width of a lock, the mutual position of lights and symbols, and tables of wind force and sea state.

In connection with the fact that the rules will be published in the fourth quarter of this year, all owners must place orders for the necessary number of copies, so estimated as to provide each vessel with the rules.

12319
CSO: 1829/40

SHIPPING SEASON ENDS ON ARCTIC RIVERS; SOME VESSELS ICEBOUND

Moscow VODNYY TRANSPORT in Russian 4 Oct 84 p 2

[Article from Yakutsk by an unidentified VODNYY TRANSPORT staff correspondent in the column "Arctic-84": "Despite the Elements"]

[Text] The words in the directive of V. Mineyev, chief of the Lena United, Order of the Red Banner of Labor, River Shipping Company, sounded like a front-line communique. And this is not a journalistic metaphor by any means. "On additional measures for arranging delivery of cargoes to the Yana, Indigirka and Kolyma regions during Arctic navigation of 1984"--Precisely so was phrased the essence of the document, issuance of which was in no way brought about by defects in professional training of the river transport workers. The ice situation in the Yana Bay and Laptev Sea region, on the whole, shaped up as extremely severe during 1984 navigation. The delivery of vitally important cargoes for enterprises in the north of Yakutsk ASSR found itself threatened with discontinuance. No significant improvement in the ice situation was foreseen, according to announcements of the weather forecasters.

Meanwhile, rigid planning figures and demands of economists of the extreme north did not give river transport workers the right to make allowance for the weather. The shipping company was faced with as specific and serious a task as possible--to provide delivery of Arctic cargoes in the quantity foreseen by Gosplan USSR before the end of navigation.

A special commission headed by V. Arbatskiy, first deputy chief of the shipping company, and V. Gotovtsevyy, chief of the North Yakutsk Administration of LORP [Lena United River Steamship Company], was formed for coordinating the actions of all elements of the shipping company in delivering cargoes to the Arctic regions. A group of the most experienced instructor captains, A. Mikhalev, G. Banshchikov, A. Kalliy and Yu. Kurilov, was assigned to the Tiksi-Nizhneyansk sector, and specialists of the Lena Basin Navigational Inspectorate and Engineering Services were in full battle readiness.

Everyone awaited some amelioration, however slight, on the part of nature. Dense pack ice, driven against the shore by the north winds, did not let even such tried and true fighters as the icebreakers "Semyon Chelyuskin", "Kapitan Sorokin" and "Kapitan Nikolayev" work together at full power. The convoying of vessels in the Cape Buor-Khaya region turned out to be especially difficult.

And the elements retreated, as if having understood that they couldn't resist such an onslaught. Cargoes went to Nizhneyansk, Kular, Ust-Kuyga and other populated points.

A. Gudkov, chief of the fleet's shipping and traffic service, tells the story: "Arctic navigation of the river transport workers began with a 2-week delay, but today all alarms are behind us. Ice formation this year started approximately 4 days earlier than usual. By this time, the cargo delivery job had been done."

But victory came with a high price. Fifteen lighters and several tankers were left to spend the winter on the Yana.

12319
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KHERSON YARD BUILDING ARCTIC SUPPLY VESSELS

Kiev RABOCHAYA GAZETA in Russian 12 Sep 84 p 1

[Article from Kherson by A. Yaitskiy, editor of the large circulation newspaper SUDOSTROITEL': "They are to Sail in the Arctic"]

> [Text] The construction of independently sailing supply vessels has begun on the ways of the Kherson Shipbuilding Production Association imeni 60th Anniversary of the Lenin Komsomol. The vessels, of a new type, will deliver cargoes to coastal points of the Arctic basin.

In the northern seas, navigating conditions are severe. The ordinary cargo carrying vessel cannot break through the ice. With construction of several atomic powered icebreakers, the problem, it seemed, had become soluble--the atomic powered Herculeses began to lead convoys of vessels practically the year around. But there arose another problem: How unload them? You know, in the North there are no equipped moorages as a rule, and they often simply are not needed there, either. Why build a moorage in the desert-like tundra, where there are no large populated points? But putting cargo ashore is necessary all the same. Geologists, reindeer breeders and builders await it.

The supply vessels are intended to solve exactly this problem. They are capable of delivering cargo to any point on the Arctic seacoast. They will be unloaded in the roadstead by means of helicopters. All cargo operations will be facilitated by the fact that cargo for the Arctic goes in containers and packages.

The time will come when a steep ocean wave will rock the new diesel-electric vessel, and its strength will be tested by ice hummocks as well. But, for now, competent masters are on the vessels--ship specialists: Shipfitters, welders, installers. The prototype of the new series has sides already raised to the 9-meter height of the building stock scaffolding. In their steel embrace is the heart of the ship--the engine room. The main generators and auxiliary mechanisms have already been mounted in it.

The powerful "breathing" of the first-born is provided by the coordinated work of two leading collectives--building ways and fitting out shops. The brigades have taken on an increased socialist obligation--to complete the assignment of

the five-year plan by the 50th anniversary of the Stakhanovite movement, and to deliver the order of the far eastern seamen earlier than the intended date. And, so far, their words are borne out by their deeds. The brigades of A. Barulev's shipfitters and A. Chernenko's electric welders are showing high output. They overfulfill the norm of each shift by 30-40 percent, ensuring high quality in the process. Both collectives are recognized as superior on the results of socialist competition.

12319
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SHALLOW-DRAFT RO-RO 'KOMPOZITOR KARA KARAYEV' FOR CASPIAN

Baku VYSHKA in Russian 22 Sep 84 p 1

[AzerINFORM article: "...to be Embodied in Steamships, Lines and Deeds"]

[Excerpts] Twenty-one September was a festive and joyful day for Caspian seamen. The motorship, which was given the name of outstanding Soviet composer Kara Karayev, arrived in Baku. Arriving at the pier to welcome the vessel, which has made a long voyage from the city of Rostock in the GDR where it was built, were workers of the Caspian Shipping Company, students and colleagues of the composer and public representatives of the capital of the republic.

The motorship "Kompozitor Kara Karayev" is fundamentally a new vessel with a horizontal method of loading--a leading one in the series being built. In order to fill its holds, dockers will not need special complex equipment and high portal cranes. Containers with cargo are placed on special trailers, which drive aboard along the loading ramp pushed out from the vessel. With the aid of two elevators they are moved to one of the cargo decks there. This type of loading is much faster and easier than the traditional one, requires less manpower and improves dockers' labor conditions and the safety of cargo. The "Kompozitor Kara Karayev" will be able to transport more than 3,000 t of cargo on a single voyage.

An essential feature of the new vessel is its shallow draft, which will enable it to pass through rivers and other inland waterways. Consequently, the number of consignees and consignors of the Caspian Shipping Company will increase.

The shipping company has made preparations in advance to receive the new vessel. The Baku port has rebuilt a berth in order to adapt it for movement of trailers and established so-called operational zones in which cargo will be accumulated. At the same time, dockers familiarized themselves with the vessel with the help of drawings and photographs.

According to the captain of the motorship, the "Kompozitor Kara Karayev" has shown excellent navigational qualities on the entire voyage from Rostock to Baku. The vessel, in developing speed of up to 16 knots, is stable, easy to control and reliable. All conditions for work and rest of the crew have been established on it.

9817
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RESEARCH AT 'NAKAT' EXPERIMENTAL SHIP DESIGN FACILITY

Leningrad LENINGRADSKAYA PRAVDA in Russian 18 Oct 84 p 4

[Article by A. Potapenko: "'Water Area' Under a Roof"]

> [Text] The ship was fighting threatening elements. The waves rolled now from the side, now from the stern, rocked it and flooded the deck. The storm already raged for half an hour. And only when the vessel began falling gradually on the side, laboratory operator K. G. Netsvetayev said in a calm voice: "Stop the disturbance. Switch off the wave generator." Konstantin Georgiyevich glanced once more at the small ship which tilted to one side from the blows of the waves and went to take down the readings of sensors. The tests of a regular ship model were completed. They were held in quite a small "water area"--the basin of the Nakat Experimental and Testing Plant of the Leningrad Shipbuilding Institute.

Many types of vessels now plying the seas received their "baptism of fire" here, at the plant as models. They have undergone tests for strength, propulsive quality and flooding. On the whole, theoretical calculations of shipbuilding engineers were checked in practice.

This production began many years ago in educational workshops, where shipbuilding students practiced. In time, after gaining the status of an experimental plant, Nakat began fulfilling complex orders for ship equipment, testing on models new types of ships and manufacturing finest marine devices.

In describing the specific feature of the enterprise, chief technologist Anatoliy Ivanovich Moskvin often used the word "unique. Indeed, the absence of series production makes it necessary to develop its own drawing and technology for every new component. Sometimes it is also necessary to build new installations. Thus, Nakat has designed a new--also a custom-made--woodworking machine and produced a unit for polishing glass. All of this was done based on Nakat's own resources. The people here are versatile. Some 120 fields of specialization are represented at this enterprise which is small on the whole. The ability to work in two or three different fields can no longer surprise anyone here. Experienced wizards such as patternmaker I. S. Sedov or lathe operator A. A. Novikov possess more than a score of related professions.

"Our workers," A. I. Moskvin continued, "can do literally everything within the framework of their production. From driving a nail to going under water with an aqualung. The brigade method of organizing labor and wages has been in force in Nakat already 1 year. Anyone familiar with this form of work will understand that in places where there is no series production the brigade method becomes acclimated only in the most harmonious collective."

What is its basic production? According to G. Ye. Aleksandrovskiy, chief of the patternmaking sector, it is "materialization" of those ideas which are born in scientific laboratories of the institute. Georgiy Yevgen'yevich has already worked 34 years in the "shipbuilding shop." The most complex models were tested with his participation. Together with developers under the supervision of Docent R. V. Borisov, he is now engaged in testing a model of a special drilling installation which is capable of "reconnoitering" the sea bottom to a depth of .5 km.

A difficult task faced the testers. After all, for drilling it is necessary that the vessel remain "perfectly still," that is it must remain in a certain position for a long time. A way out was found. Combined operation of the so-called cruise propulsion units [marshevyye dvizhiteli] and steering up screws fixes a vessel in an assigned position. Calculations of their operating schedule are now underway. New tests are next in turn. A model of a self-propelled pontoon for a floating crane has already been completed. Its theoretical hoisting capacity is 1,000 t or several times greater than the ones now in operation. Ice navigation vessels and racing yachts are waiting their turn...

Quite often research workers are approached by representatives of maritime shipping companies with a request to study specific behavior features of ships that have been built long ago under one or another type of conditions. Let us say that accidents of small fishing trawlers during stormy weather in shallow water have become more frequent. What is the cause?

"Well, let us assume that to find out the cause would not be of special difficulty," Docent B. V. Mirokhin described, "it is the deformation in the profile of a large rolling wave wheeling to the coast. But how to prevent an accident in such cases--this was worth thinking about. We have suspended a a sort of 'second bottom' in the basin. It should have imitated the relief of shallow water. The wave generator rocked the water in the basin and created a large wave of an assigned profile. The model of a fishing vessel 'suffered shipwrecks' many times until the discovery of optimum versions of mooring a trawler in strong choppy seas."

It would seem that there is no other way of testing floating models other than in their own element--water. But it does not splash in the extensometric laboratory where vessels are tested for strength. The 6-meter transparent boxes made of acrylic plastic also bear little resemblance to the usual contours of vessels. We have only models of their hulls before us. They are indeed utterly precise and with all necessary load-bearing structures, without which a hull would simply fall apart.

If there is no water in the laboratory then rough seas cannot be created. How can a ship be tested then?

"As the seamen say, it is not the sea that sinks it, but the winds," A. I. Frumen, chief of the sectorial strength laboratory explained. "With the aid of special installations we sort of 'construct' a wind. Compressed air is used to imitate the weight of a loaded vessel, which is introduced into a heremetically sealed hull under pressure. Sensors, which measure the overall bend of a vessel under load as well as deformation of its individual sections, are placed in the most "weakest" spots."

When the tests are underway, even the models crackle under stress. It happens sometimes that a hull cannot withstand the loads. It is then necessary to start everything from the beginning...

There are many new models on the "building slips" of the laboratory today. Among them are a hauling lighter and a floating drilling installation. Time will pass and real large vessels under the Soviet flag, which were built based on their example and likeness and which include all of the latest achievements in shipbuilding, will appear in the ocean expanses.

9817
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'SEVMORPUT'' NUCLEAR-POWERED ARCTIC CONTAINER/LIGHTER SHIP

Moscow PRAVDA in Russian 24 Oct 84 p 6

[Article by V. Chertkov: "The First Nuclear-Powered Transport Ship, a New Type of Maritime Vessel Developed in the USSR"]

[Text] The world's first icebreaker-transport vessel with a nuclear power unit of 40,000 horsepower capacity is being laid down in Kerch at the Zaliv Plant imeni V. Ye. Butoma. It is designed for transporting lighters or international standard containers in Arctic regions.

The appearance of the vessel on the title page of the project does not give a true idea of the nuclear-powered ship, which was named "Sevmorput'", but even here the vessel astonishes one with the swiftness and simplicity of lines and size. After familiarizing oneself with its basic characteristics, it becomes clear that a giant, which is distinguished by a carefully thought out design, will sail in the ice.

Great concern has been manifested for the crew, for after all it will have to work in high latitudes. Living quarters are rendered in a superstructure, which is removed from the engine room. The lower tier of cabins is designed in a so-called floating version in order to eliminate extensive shaking and vibration which occurs in ice.

Add three football fields and you will get an idea of one of the sizes of the vessel--its length. Its width will also be impressive--32.2 m. Its carrying capacity is 33,500 t. The "Sevmorput'" will sail at a speed of 21 knots in clear water --nearly 40 km per hour, if one speaks in the overland terms. The nuclear-powered transport ship will move at a speed of 5 knots practically in any ice field. Its hull will withstand the most powerful Arctic pressure.

The "Sevmorput'" will be able to take aboard 74 lighters, each 19 m long and 10 m wide. A deck crane of 500-t hoisting capacity will rapidly lower them in water from where they will be moved to berths by pusher tugs.

But what water is there to speak of in the Arctic? The nuclear-powered ship will operate in the northern seas only during the navigation season period, and then in other latitudes. Up to tropical ones, for which it is also designed.

Nevertheless, the basic intent of the vessel, which was designed by the Baltsudproyekt Central Design Buro, are mass lighter haulings of various national economic cargo to the developing regions in the Arctic basin.

I have asked the creators of the nuclear-powered ship: "How many people will control this most complex structure?" "Only 64." Incidentally, all living quarters on the vessel are single berth. The "Sevmorput'" will have a sauna, a swimming pool and a sports hall.

The creation of nuclear-powered icebreaker-transport container-lighter ships with a nuclear power unit is a qualitatively new step in world shipbuilding and in implementing the long-term program for transportation and economic development of the Soviet north.

The "Sevmorput'" is not an experimental vessel, but a first one in a planned series and it will open the way for others. Dozens of largest plants in the country will participate in the building of the nuclear-powered transport ship, and Kerch shipbuilders have pledged to launch it by the 27th CPSU Congress.

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BRIEFS

HORIZONTAL SHIP LOADING INTRODUCED--Baku--A fundamentally new freighter with horizontal loading capacity has arrived in Baku for use by Caspian Sea seamen. The ship, the Kompozitor Kara Karayev, is the first in a series built by ship builders in the GDR. Dock workers will not need portal cranes and other complex equipment to load its holds. Containers of freight to be loaded are mounted on special trailers that are moved into the hold along a ramp which opens out from the ship. Such loading is easier and quicker than the traditional method and in addition, working conditions for dockers are improved and the safety of cargo enhanced. [Text] [Moscow SEL'SKAYA ZHIZN' in Russian 22 Sep 84 p 1] 8750

YUGOSLAVS PROVIDE SEA FERRY--(TASS)--The national flag of the USSR has been unfurled on the flag staff of the sea ferry Sovetskiy Dagestan, which was built at the Ulyanik Shipyard in the Yugoslov city of Pula. This is the first of a serier of eight large ships of this type intended for Caspian Sea seamen. The ship can carry simultaneously about 30 rail cars, 70 automobiles and more than 200 passengers. [Text] [Moscow SEL'SKAYA ZHIZN' in Russian 22 Sep 84 p 3] 8750

SECOND YUGOSLAV SEA FERRY--(TASS)--The transfer of the sea ferry Sovetskiy Tadzhikistan to the Soviet Sudoimport Association took place in a festive atmosphere at the Ulyanik Shipyard, one of the largest in Yugoslavia, located in the city of Pula. This is the second in a series of eight such ships built by the ship builders of this enterprise for use in the Caspian Sea. Ships that have come off the building slips at Ulyanik are well known to Soviet seamen. More than 20 ships of various designations have been built in Pula on orders for the USSR. Among them are two unique ferries which traverse the longest route covered by ferries in the world, from Varna to Ilichevsk. [Text] [Moscow VODNYY TRANSPORT in Russian 2 Oct 84 p 1] 8750

NEW MODERN TANKER COMMISSIONED--Riga (TASS)--The name of Admiral Georgiy Nikitich Kholostyakov has been given to an ocean going tanker which has joined the fleet of the Latvian Ordena Trudovovo Krasnovo Znameni [Order of Labor Red Banner] Shipping Company. Ship builders of the Kherson Shipbuilding Association imeni 60-letiya Leninskogo Komsomola constructed the tanker. It is capable of carrying up to 26,000 tons of bulk oil cargo. The ship is equipped with modern radio navigation and radar equipment. An efficient filter

system will protect sea waters from pollution by oil products. Conditions for work and rest on the new ship are excellent: individual cabins, comfortable lounges, a gymnasium and a library. The ship was still under construction when a letter arrived in Riga from the well known cultural figures and friends of the admiral: A. Raykin, A. Pakhmutova, N. Dobronravov and V. Khokhryakov; the test pilot and Hero of the Soviet Union K. Kokkinaki and the film writer K. Podymy. They offered their services in gathering materials for a floating museum which will be set up on the new ship. The tanker Georgiy Kholostyakov arrived at Ventspils, its port of registry, a few days ago. [By Ya. Motel'] [Text] [Moscow IZVESTIYA in Russian 30 Sep 84 p 6] 8750

NEW TUG TO MOVE LIGHTERS--Sovetskaya Gavan (Khabarovskiy Kray)--A new tug built at the Sovetskaya Gavan plant of Minmorflot, USSR (Ministry of Maritime Fleet, USSR) will be a big help in loading and unloading giant lighters. Experience has shown that this "sea tractor" delivers full barges to shore and returns empty ones efficiently back to the freighters twice as fast as ordinary port tugs. The shipbuilders produced this new tug without the reorganization of production. [Text] [Moscow SEL'SKAYA ZHIZN' in Russian 4 Oct 84 p 1] 8750

NEW CONTAINER SHIP DELIVERED--A new motorship has joined the Black Sea Shipping Company: the Kapitan Valeriy Ushakov class cellular container ship named after the heroes of Monkady. The Geroi Monkady is the third ship of its series to join the Black Sea Shipping Company. Ship builders in Warnemunde (GDR) built her. The ocean going captain V. Kulikov has taken charge of the new crew. [By B. Sashina] [Text] [Moscow VODNYY TRANSPORT in Russian 9 Oct 84 p 2] 8750

SOVIET-FINNISH SHIPPING SYMPOSIUM--The two day Soviet-Finnish symposium held in Moscow, "Prospects for the Development of Passenger Cruise Ships" has completed its work. Leading specialists from USSR Gosplan, main USSR shi ping companies, enterprises and organizations of the USSR Ministry of Maritime Fleet, took part in the symposium on the Soviet side. The public Finnish firm VARTSILA, which recently celebrated its 150th anniversary, has maintained the closest of ties with the Soviet Union over the last 52 years. In recent years VARTSILA has delivered five ships to the USSR. In turn, the Finnish firm imports to Finland from the USSR diesel generators, radio equipment, float-docks and many other items. [Text] [Moscow VODNYY TRANSPORT in Russian 13 Oct 84 p 1] 8750

LENA FLEET AUGMENTED--Yakutsk--Two new container ships have joined the Lena fleet; they are the Kurgan and the Kemerovo. These motorships, built by Rumanian ship builders, were brought to the port Tiksi by pilots from Spetsmorprovodok (a specialized ship pilots' organization). Command of the ships was transferred to the experienced Lena captains V. Kanayev and N. Yermolenko. Subsequently, they arrivnd in Yakutsk with a load of construction materials, from where, having been offloaded, they set out for Kirensk, their port of permanent registry. [By a staff correspondent] [Text] [Moscow VODNYY TRANSPORT in Russian 16 Oct 84 p 1] 8750

CSO: 1829/16

CHIEF ON TOBOLSK PORT OPERATIONS

Moscow RECHNOY TRANSPORT in Russian No 9, Sep 84 p 7

/Article by V. Kravtsov, chief of the Tobolsk port: "Years and People: On the Occasion of the Tobolsk Port's 250th Anniversary"/

/Excerpts/ With the discovery in Tyumen Oblast of petroleum and natural gas deposits, construction work began on an up-to-date transshipment port along with a well-developed network of railroad sidings. The first stage was put into operation in 1969. In that same year the landing was converted into the Tobolsk port. Now this is a highly developed transport enterprise, having at its disposal up-to-date cargo-handling machinery, cargo and passenger vessels, and skilled personnel. During the navigation season the total number of employees amounts to more than 2,000 persons.

The precipitous development of the petroleum and gas industry in Western Siberia led to an intensive growth in the volumes of the cargoes processed and shipped through this port. During the years of the 9th and 10th Five-Year Plans the shipment of cargoes tripled and amounted to 2.4 million tons per navigation season, while their processing quadrupled and amounted to more than 4 million tons.

There was likewise a significant increase in the volume of hauls during the 11th Five-Year Plan. During the past three years more than 3.4 million tons of various cargoes have been shipped just to the petroleum-and-gas-bearing rayons of Tyumen Oblast.

The group has successfully coped with fulfilling the plan and its socialist pledges for 1983. Some 11,700 tons of cargo in excess of the plan were shipped, 82,700 passengers were carried, the assigned task with regard to handling cargoes was over-fulfilled by 215,000 tons, layovers while vessels and rail cars are being processed were reduced, as compared to the norm, labor productivity was increased by 8 percent, and 280,000 rubles of profits above the plan were obtained.

These results were achieved due to the socialist competition which was unleashed, to the introduction of progressive technology and advanced working methods in cargo-handling operations and the fleet, the precise organization of comprehensive service to the fleet, and the extensive application of the advanced method of the Leningrad transport workers.

Employed in this port are 10 groups and 336 Communist shockworkers; 750 persons are striving to attain this lofty title, and five consolidated, comprehensive brigades of port workers have been created, including one which operates on a self-supporting basis.

The on-schedule and high-quality preparation of the port-and-mooring facilities for the current navigation season allowed us to proceed to work from the first few days in an organized fashion and to ship out all the cargoes which had been brought in during the winter period to the Tyumen Oblast's workers in the extractive industry. This port's group is full of determination to fulfill the assigned tasks for 1984 and those of the five-year plan.

2384
CSO: 1829/41

CAPTAIN VESELOV OFF-SHORE TIMBER LOADING METHOD

Moscow MORSKOY FLOT in Russian No 10, Oct 84 pp 28-29

[Article by S. Pesterov, Far Eastern Shipping Company KhEGS [self-financing operational group of ships] No 2 group engineer-controller, and Ye. Bogolyubov, MORSKOY FLOT correspondent: "Captain Veselov's Method"]

[Text] Intensive development of Far Eastern economic potential requires a constant increase in import/export traffic. A large share of this traffic consists of timber cargos. The annual volume of export rough timber passing through Primorye ports amounts to several million tons, of which nearly half a million tons go through Primorye Kray shipping points.

The creation and development of systems to handle timber stacks has increased the throughput capacity of railroad, industrial yard, port and harbor facilities as well as the traffic capacity of transportation resources. Delays in timber deliveries have been shortened, the cost of shipping and transshipping has been reduced and labor requirements have been lessened in all branches of the shipping process.

However, for a long time one of the major "bottle necks" has been and remains the organization of rough timber, i.e. sawed lumber and pulpwood, handling at Primorye roadstead facilities. Until 1977 this took place in the typical manner: timber warehouse/crane/timber hauler/wharf/crane/boat (barge and launch)/ship's hoist/ship. Lighters were not always operational, especially at small facilities. This was often also true of wharves and shore-based handling equipment. The average timber loading rate was 400-600 tons/day, depending on weather conditions.

The port center at Rudnaya Pristan was especially difficult for timber loading. Here, pier capacity did not allow effective simultaneous handling of ore concentrates, bulk cargos and timber. Thus ordinary timber hauling ships sometimes spent two or more weeks awaiting their turn to load.

In 1976, V. Veselov, captain of the Far Eastern Shipping Company vessel "Lakhta", proposed a roadstead method for loading timber bundled in flexible USPAK [not further identified] straps using a closed towline (CTL). The first instance of a vessel loaded with timber using the new method occurred in 1977 at Plastun. Since that time the CTL method, as it is now called, was

developed at Malaya Kema and Rudnaya Pristan (Klokov Bay). These ports are located in open bays. At Malaya Kema, as in many other Primorye ports, there is no natural shelter even for harbor vessels. At present timber loading is carried out using the CTL method alone at Rudnaya Pristan and Malaya Kema while barges are used at Amgu and Svetlaya. A great deal of rough timber is shipped to Japan from these Primorye shipping points annually and nearly 80 percent of this is carried in USPAK packets.

Timber is the basic, and for now only, type of raw material shipped from the undeveloped shores of the bays mentioned. There is no great volume of traffic here. Thus, there is no need to construct major port facilities. Under these conditions the CTL method is highly promising.

Just what is the CTL method? It consists of a rope run between the shore and a vessel anchored at the roadstead through a system of blocks and drive mechanisms. There are two CTL layouts depending on the location of the drive mechanism: shore- or ship-based.

With the CTL method, timber is loaded in the following manner. The vessel approaches as near as possible to the shore, ties up to a mooring buoy and deploys two anchors, holding itself parallel to the shore. The CTL rope is connected from the vessel to the shore by a launch. The CTL linkage equipment is set up on board the ship.

CTL operators, located at control posts on shore and aboard the vessel, control timber loading. The package strap is attached to the rope by special fasteners or simply by tying the strap to the rope with ordinary line. After fastening the packet to the CTL, the operator engages the slipway drive winch, the packet goes into the water and is towed to the vessel side. Normally 15-20 packets are placed on a line at 20-25 meter intervals.

On instructions from the shipboard CTL operator, timber packets are brought to alternate holds, lifted from the water by the ship's crane and stored in holds or on deck.

Experience with CTL method rough timber/pulpwood loading on the Far Eastern Company vessels "Lakhta", "Kulunda", "Unzha" and "Verkhoyanskles" has shown that the new technique raises total loading capacity to 500-800 tons/day. Now vessels carrying 3,700 cubic meters of timber often spend only 3-3.5 days in loading.

In 1980 the crew of the vessel "Lakhta" was awarded a Third Grade Certificate and Captain V. Veselov, First Officer Ye. Maksimov, boatswain S. Brechko, electrician V. Smirnov, carpenter V. Yefremov and seaman V. Vorst received silver and bronze VDNKh [Exhibition of Achievements of the National Economy of the USSR] medals.

In the same year a Far Eastern Shipping Company management directive "CTL use in timber loading at shipping points" was published, covering a series of

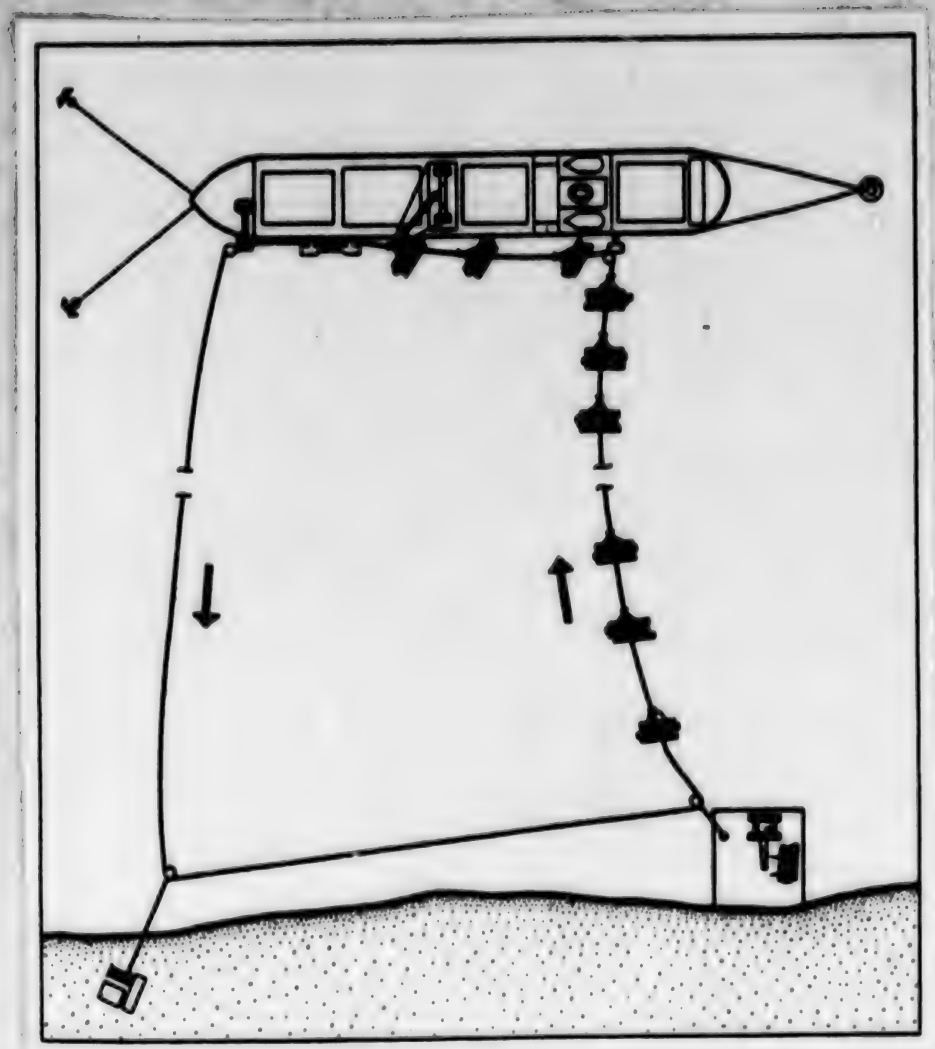

Diagram of a closed towline system

measures for further introduction and improvement of timber loading organization and techniques for vessels at Primorye shipping points using the CTL method.

In 1982 a conference was held by representatives of the Vladivostok "Dal'lesprom" Production Association and the Far Eastern Shipping Company on questions of expanding rough timber packet cargo volume, improving the process of loading this material aboard ships and economic relations between the parties. The discussions resulted in the conclusion that at the present time the most suitable means of loading packaged rough timber aboard vessels in the Primorye at Malaya Kema, Amgu and Klokov Bay, as well as Svetlaya Bay in the near future, is the CTL method.

Implementing this decision at the beginning of 1982, the crew of the "Kulunda", headed by Captain R. Ishchenko, together with the Krasnorechenskiy

timber farms, with its energetic director S. Opanasyuk, began loading timber using the CTL method at Klokov Bay, located 4 km north of Rudnaya Pristan.

Finally, scientists and workers endorsed Captain V. Veselov's method. Critical studies began at the Dal'morniiproyekt [Far Eastern Ocean Planning Administration], DVTsPKB [Far Eastern Central Planning and Design Bureau] and Forestry SRI levels.

For example, at the end of 1982, the Dal'niilesprom developed and the Dal'lesprom approved technical guidelines entitled: "Loading of bundled timber materials on vessels at anchor using closed towlines" which was intended for workers in the forestry industry.

By 1983 the economic efficiency of CTL introduction into the Krasnorechenskiy timber farm (from Klokov Bay) amounted to 2.5 rubles of additional revenue for each cubic meter of timber shipped, while a 1.25 ruble value was obtained by the Malokemskii timber farm.

At present "Krymsk" and "Sibir'les"-class timber haulers make 20-25 passages annually hauling timber from the Primorye shore to Japan. By eliminating 2-3 days of loading downtime per trip, a vessel can complete an average of three additional runs, earning approximately 90,000 rubles in additional revenue. Timber is no longer piled up on shore losing its value to consumers.

The CTL method allows work around the clock even under weather conditions which prohibit the use of lighters and barges. According to a DVTsPKB [Far Eastern Central Planning and Design Bureau] plan entitled "Roadstead timber loading using the CTL method," the economic effect of its introduction should, in the maritime component alone, reach 451,000 rubles per year for one vessel at a capacity of 2,050 cubic meters/vessel-day, i.e. a 10-ton packet of timber can be shipped every 5 minutes. There is no doubt about the economic suitability of this method. Further, the revenue which it can produce is several times greater than the expenditures required for its introduction.

In its technical and organizational aspects, timber loading by means of the CTL method is simple and can be introduced without special complications. It requires a minimal amount of equipment and materials: a crane truck, drive- and take-up winches, about 2,000 meters of waterproof synthetic rope 23-26 mm in diameter, a receiving block, two snatch blocks and a slipway which can be easily made by welding rails together with (or without) an undercarriage.

A special department for packaged cargo has been established in the Far Eastern Shipping Company. In 1984 a further two ships are planned for refitting to accommodate CTL operations. Captain-Instructor V. Tereshchenko is especially assigned to the consideration of questions involving vessel anchorage safety at shipping points. KhEGS [self-financing operational group of ships] No 2 personnel render continuous assistance to vessels using the CTL method. DVTsPKB designer V. Gutnov has developed a safer automatic lock for USPAK

straps. The Primorye Timber Production Organization has begun to prepare a yard and equipment for CTL operations at Svetlaya. Dal'niilesprom scientific personnel are working on dissertations on the subject.

But this is not enough. There are still many unresolved questions: final work and approval of handling equipment both on shore as well as on board the vessel; the performance of loading operations on board the vessel by specialized brigades from the timber farms (it is time to free crew members from this work since they have other tasks); more regular, planned vessel traffic for timber loading at shipping points during the summer. In short, urgent and energetic organizational measures are required in order to give this important state matter its required scope and raise it from its current status as a protracted experiment.

The CTL method allows not only the loading of timber but the transport to and from vessels of various waterproof soft and hard containers, barges and cargo platforms. The system is a unique rope conveyor assuring continuous cargo handling operations. It can be used to transport any type of cargo including bulk materials. In 1981, for example, the vessel "Lakhta" was used to test a variation of transporting industrial wood chips in waterproof plastic containers which was very interesting to both Primorye timber farm shippers and Japanese recipients. The possibilities of CTL method cargo handling are being studied at shipping points located at the mouth of the Amur River.

Thus the rope/water roadway born in Captain V. Veselov's imagination and brought to life by the creative cooperation of his crew has a promising future of further development.

12746
CSO: 1829/42

VARIOUS OFFICIALS ON MAGADAN PORT PROBLEMS

Moscow MORSKOY FLOT in Russian No 10, Oct 84 p 14

[Unattributed editorial: "Our readers answer: 'Magadan Port problems'"]

[Text] M. Kurnosov's article, entitled "Magadan Port problems", published in this journal (MORSKOY FLOT, 1983, No. 12) noted serious shortcomings in maintenance of port shipping and receiving schedules, handling conditions and in the provision of transshipping facilities, warehouse construction and other docker needs.

The editors received replies from several leaders of services and organizations participating in the origination of these problems.

The deputy chief of the Main Northern Trade Administration of the RSFSR Ministry of Trade, A. Kolychev, informed us that three cranes for use with heavy containers, four lift trucks and two electric loaders have been made available to the Magadan Trade Administration.

A. Kolychev also shared the opinion expressed in the article that an increase in transport work efficiency depends largely on how quickly a unified system capable of meeting the requirements of loading/unloading equipment needed in maritime and ground transportation can be established.

RSFSR Deputy Procurement Minister, N. Kalmyk, informed us that in 1979-1983 the Magadan Grain Product Administration introduced mechanized warehouses, handling yards, etc. and is engaged in the construction of new warehouses with state-of-the-art technology. The composite program was approved by the RSFSR Ministry of Procurement in order to ensure timely delivery of flour, oats and mixed feeds to the Far North and to reduce rolling stock downtime during loading operations.

In February of 1984 the ministry heard Magadan Grain Product Administration leaders on the questions of organizing cargo handling operations and applying mechanized resources in Magadan facilities. A plan was outlined for further development of the administration's material handling base for 1984-1990. This plan provides for the construction of grain storage facilities, mechanized yards for processing heavy containers and other matters.

A. Pinson, deputy director of the Eastern Motor Transport Association of the RSFSR Ministry of Motor Transport, informs us that the article cor raised several problematic questions involving the operation of the Magadan transportation terminal.

The construction of supplementary projects for the Magadan Motor Transport Production Association (MagPATO) is planned for 1984-1985.

At present, MagPATO is working at a 220-240 machine shift rate per month, although normally 190 machine shifts are adequate to assure an average daily delivery volume of 8,000 tons. In order to fulfill its planned transshipment volume MagPATO has to secure motor transport resources from other organizations due to extremely poor truck usage, excessive down time in loading operations and document preparation and for a variety of other reasons. Magadan transport terminal work is adversely affected to an extreme degree by insufficient port warehouse capacity, as well as single shift work and poor facilities at most cargo receiving areas, preventing reception operations from proceeding at a pace in accordance with the port's operations.

In spite of these difficulties, the USSR State Committee for Material and Technical Supply's first quarter 1984 cargo handling target for the Magadan Oblast was met due to the efforts of transport terminal personnel.

A. Lebed', deputy chairman of the USSR State Committee for Material and Technical Supply, reports that in 1984 a committee operating group for the delivery of products and shipment of cargo to the Far North, consisting of the managers of the Far Eastern and Sakhalin shipping companies, the Port of Magadan, the Magadan Transport Administration and applicable ministries is strictly on course in supplying Far Northern regions with all necessary goods.

A. Grishin, deputy chief of the Main Administration for Steel Construction of the USSR Ministry of Installation and Special Construction, reported that work on the installation of a mechanized, metal warehouse for containers by the Dal'stal'konstruktsiya Trust was finished in 1983. Due to unsatisfactory fastener installation by the general contractor, fencing work was completed in January of 1984 (the letter was dated 20 February 1984). An examination showed that this information does not reflect the actual situation as confirmed by two photographs taken on 20 April 1984.

G. Lapyt'ko, deputy chief of the Soyuzpod"emtransmash Association, did not fulfill his promises to deliver five bridge cranes to the Port of Magadan.

The editors note that the directors of the Far Eastern (Yu. Vol'mer) and Sakhalin (S. Kamyshov) shipping companies did not show any interest in M. Kurnosov's article, in spite of the fact that we asked them for their opinions on the problems mentioned in the article.

12746
CSO: 1829/42

RECONSTRUCTION WORK TO IMPROVE ODESSA PORT OPERATIONS

Moscow VODNYY TRANSPORT in Russian 7 Jun 84 p 1

[Article by V. Smirnov, Odessa: "Reconstruction Again"]

[Text] It seems that quite recently the first mechanized complex to process food cargos in our country was developed at the Odessa port. Yet preliminary work is already being carried out now for its reconstruction! Just what has caused this? The fact is that several serious problems are now arising when the goods are processed. The mechanized complex was developed at the 22nd and 23rd berths, where a marine terminal was formerly located, and therefore the railroad tracks pass at a considerable distance from the berth line. In addition, a single railroad branch serves for two berths. Due to the failure of the railroad operations to adjust to the ever-increasing volume of goods processing in accordance with the direct methods, the idle times for the docker-machine operator brigades are increasing.

There is one more inconvenience. The portal cranes are far from the work front and cannot feed the freight directly to the ramp. Therefore, many lift trucks are employed at the complex that in essence fulfill part of the work of the cranes.

"Reconstruction of the mechanized complex will make it possible for us to have a better solution to the problems which the party and government pose for us: to reduce the cost and raise labor productivity," says Ye. Rudenko, chief of the second area of the port.

After reconstruction, three railroad tracks will appear at the berths. One will pass under the portal cranes, which will make it possible to ensure unloading of piece goods. A permanent ramp to load refrigerator and box cars will be positioned between the two other branches. The crane boom will be able to reach it easily. The ramp will be constructed in consideration of the latest requirements of technology for processing food cargos. It will be more convenient to feed the cars and the intrashift idle times will be reduced.... This will permit a maximum increase in the work rates of the dockers, and fewer people and machines will be engaged in processing the vessels.

12151
CSO: 1829/316

INTEGRATED RAIL-RIVER CONTAINER SHIPPING URGED

Moscow RECHNOY TRANSPORT in Russian No 9, Sep 84 p 13

/Article by G. Blyumkina and S. Podosenov, GIIVT /Gorkiy Institute of Water Transport Engineers/: "In the Interests of the National Economy: Discussion of a Problem"*/

/Text/ Results of calculations made for individual water-transport centers have shown the feasibility of carrying out cargo hauls in containers from stations of the Northern Railroad on the following sections: Yermolino--Nerekhta--Yaroslavl, Sharya--Galich--Buy--Danilov, Vologda--Yaroslavl, with their transshipment at the Yaroslavl port to river transport and subsequent delivery to the ports of the VORP [Volga United River Shipping Company] located below Gorkiy, as well as to ports of the KRP [Kama River Shipping Company] and the BRP [Belaya River Shipping Company]. Within the boundaries of the SZRP [Northwestern River Shipping Company], the MRP [Moscow River Shipping Company], and the VDRP [Volga-Don River Shipping Company] it is not profitable to carry out such hauls.

At the Gorkiy Water-Transport Center it is economically feasible to haul cargoes in containers from stations of the Gorkiy Railroad on the Vladimir--Gorkiy Section with a transshipment to river transport at Gorkiy and their subsequent delivery to Volga ports situated below Ulyanovsk, as well as to ports on the Kama and White Rivers. On the Murom--Kovrov Section--with deliveries to Astrakhan, Perm, and ports situated below Cheboksar, as well as to ports of the KRP, BRP, and VDRP. On the Arzamas--Gorkiy Section--with deliveries to Astrakhan, Perm, and the ports of the BRP. The zone of the trend toward direct, integrated rail-river transportation at the center under consideration is limited by the following stations: Vladimir, Kotelnich, Arzamas, and Murom.

Hauls of cargoes in containers are feasible from the station of the Gorkiy Railroad on the Turma--Sviyazhsk--Kazan Section with transshipment at Kazan to river transport and subsequent deliveries to the ports of the BRP and VDRP, as well as to Cherepovets, Togliatti, Volgograd, and Astakhan. At the Kanash--Sviyazhsk Section--with deliveries to the ports of the BRP, as well as to Perm, Togliatti, Volgograd, and Astrakhan.

For the Ulyanovsk Water-Transport Center hauls are economically feasible on the

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* G. Kunakhovich and I. Isayeva, "Integrated Hauls: Conjectures and Reality," RECHNOY TRANSPORT, No 5, 1984.

Krasnyy Uzel--Ruzayevka--Inza--Ulyanovsk Section, with transshipment at the Ulyanovsk port with subsequent deliveries by river transport to the ports of the KRP and on the Akbash--Ulyanovsk Section, with deliveries by river transport to the ports of the SZRP, the KRP, as well as to Yaroslavl, Kineshma, Gorkiy, Volgograd, and Astrakhan.

At the Kuybyshev Water-Transport Center on the Nikel--Orenburg--Kinel--Kuybyshev Section hauls are feasible with transshipment to river transport at the Kuybyshev port with subsequent deliveries to the ports of the SZRP, KRP, VDRP, as well as to all ports of the VORP with the exception of Ulyanovsk, Togliatti, Saratov, Astrakhan, and on the Penza--Zvezda Section with deliveries by river vessels to the ports of the KRP, and, finally, on the Zvezda--Kuybyshev Section with deliveries to the ports of the SZRP, KRP, as well as to all ports of the VORP situated above Ulyanovsk.

It is economical to haul cargoes in containers at the Saratov Water-Transport Center from stations of the Volga Railroad on the Aleksandrov Gay--Urbakh--Saratov Section with transshipment at the Saratov port to river transport and subsequent delivery to the ports of the KRP, BRP, as well as to all the ports of the VORP situated above Togliatti. On the Sennaya--Saratov and Atkarsk--Saratov Sections, with deliveries to the ports of the KRP, BRP, and all the ports of the VORP situated above Ulyanovsk.

Hauling cargoes in containers in direct integrated railroad transport at the Volgograd Water-Transport Center is feasible to carry out on the Morozovskaya--Volgograd and Kuberle--Volgograd Sections, with transshipment to river transport in Volgograd and deliveries to ports of the VORP, KRP, BRP, and to Cherepovets. On the Ilovlya--Volgograd Section, with deliveries to the ports of the SZRP, KRP, BRP, and to the ports of the VORP situated above Saratov.

Cargoes in containers are beginning to be hauled through the Rostov port from the railroad stations of the Georgian, Azerbaijan, and Armenian SSR's, the Krasnodar and Stavropol Krays, as well as stations located on the following sections: Zapopozhye--Chaplino--Ocheretino--Rostov and Voroshilovgrad--Kandrashevskaya--Semeykino--Rostov. In shipping cargoes from the Krasnodar and Stavropol Krays, it is effective to carry out hauls to the ports of the SZRP, BRP, KRP, and VORP, with the exception of Volgograd. In shipping cargoes from stations on the Zaporozhye--Rostov and Voroshilovgrad--Rostov Sections, the feasible points of destination will be the ports of the VORP (with the exception of Yaroslavl and Volgograd), as well as Cherepovets, Perm, Kambarka, and Ufa.

Through the port of Kambarka it is economical to transship containers arriving from stations on the Izhevsk--Agryz--Kambarka Section; moreover, feasible points of destination will be Perm, Ufa, Togliatti, Volgograd, Astrakhan, Rostov, while for containers arriving from stations on the Chelyabinsk--Kamensk Uralskiy--Sverdlovsk--Kamabarka Sections such points of destination will be Cherepovets, Yaroslavl, Kineshma, Volgograd, and Rostov. From stations of the Kustanay--Zolotaya Sopka Section it is feasible to deliver cargoes to Cherepovets, Yaroslavl, Kineshma, Volgograd, and from the stations of the Kurgan--Kamensk Uralskiy Section--to Cherepovets, Yaroslavl, Kineshma, Ulyanovsk, Togliatti, Saratov, Volgograd, and Rostov.

Cargoes in containers from railroad to river transport, with a transshipment through the Ufa port, flow from stations on the sections from Frunze and Alma-Ata to Berlik and further on, the Karaganda--Tselinograd--Tobol--Kartaly Sections. In this case the feasible points of destination will be the ports of the VORP situated above Cheboksar, as well as the ports of the SZRP. From stations on the Kartaly--Magnitogorsk Section it is economical to haul cargoes to Cherepovets, Yaroslavl, Kineshma, and from stations on the Magnitogorsk--Ufa Section--to ports of the SZRP, Yaroslavl, Kineshma, and Gorkiy.

At the Perm Water-Transport Center it is feasible to carry out cargo hauls from stations on the Sero-Goroblagodetskaya--Chusovskaya--Perm Section with a transshipment to river vessels in Perm destined for Togliatti and Volgograd and on the Solikamsk--Nyar--Perm Section, with deliveries to the ports of Leningrad, Cherepovets, Rostov, and those of the VORP (with the exception of Kazan).

Based on the calculations made, a scheme has been worked out for the optimal hauling of cargoes in containers in direct, integrated rail-waterway transportation in the steamships of the Central and Northwestern Basins. Out of 1241 routes examined, in 979 it is profitable to develop the hauling of containers in a direct, integrated rail-waterway transportation.

At the present time railroad transport is carrying out considerable volumes of freight hauls in containers parallel with navigable river routes. These are primarily hauls between points of the United Volga, Moscow, Volga-Don, Kama, and Northwestern River Shipping Company. Selected studies have shown that in the course of a navigation season just between 11 ports of the shipping companies of the Central and Northwest Basins railroad transport hauls more than 185,000 tons of freight in universal containers. With regard to the individual parallel directions, the container flows mastered by railroad transport exceed by 55--170 percent the volumes of the hauls mastered by river transport. Included among such runs are the Leningrad--Moscow, Gorkiy--Leningrad, and Gorkiy--Kazan.

In determining the sphere of the feasible utilization of river transport in mastering the revealed container flows, 210 haul directions were examined.

Calculations have shown that in 198 of the hauling directions the specific cited railroad transport outlays exceed the outlays of river transport, and only in 12 cases did the latter turn out to be higher. It should be noted that river transport is more economical than railroad transport by 4.1 rubles per ton.

Considerable effectiveness from converting freight hauls in containers to river transport can be achieved on the following sections: Kazan--Kirov, Perm--Petrozavodsk, Perm--Rostov, Perm--Ust-Donets, Perm--Volgograd, where the specific cited outlays of river transport are less than those of railroad transport by 5--10 rubles per ton. On the following sections: Leningrad--Perm, Petrozavodsk--Ufa, Petrozavodsk--Togliatti, Petrozavodsk--Kuybyshev, Petrozavodsk--Astrakhan, Cheboksary--Astrakhan, Perm--Togliatti, Kambarka--Astrakhan the difference in the cited outlays amounts, on an average, to 7.6 rubles per ton, while on the sections from Leningrad to Ufa, Ulyanovsk, Togliatti, Kuybyshev, and Astrakhan, from Petrozavodsk to Kineshma, Gorkiy, Cheboksary, Kazan, Kambarka, Ulyanovsk, Volgograd, from Cherepovets to Perm, Kambarka, Ufa, and a number of other ports this figure comes to about 6 rubles per ton.

Excess in the specific cited outlays of river transport as compared with railroad transport was revealed in the following routes: Moscow--Rostov, Moscow--Ust-Donets, Ufa--Kuybyshev.

2384
CSO: 1829/41

ODESSA PORT IMPROVEMENTS SUMMARIZED

Moscow MORSKOY FLOT in Russian No 8, Aug 84 pp 4-5

[Article by V. Zolotarev, chief of the Port of Odessa: "Plans Urging Progress"]

[Excerpts] The port workers of Odessa are busy carrying out the plans of the fourth year of the five-year plan and fulfilling the increased socialist obligations. The draft obligations were ready in November 1983, immediately after receiving the plan quotas from the shipping company. But after the December (1983) Plenum of the CPSU Central Committee, major points were revised and adjusted.

Analysis of production operations at the Odessa Transport Center and all its cargo areas and installations recently has shown that the search in the area of production organization and new methods of cargo working has produced effective results.

In 1980, the net intensity of working vessels hauling unrefined sugar was 3,700 tons per vessel per day. This indicator was considered good. However, as a result of carrying out an entire range of organizational and technical measures in the third area in 1983, net intensity was almost 5,300 tons per vessel per day. In 1983, here they handled 1,180,000 tons of cane sugar with designed capacity of the facility equaling 1 million tons.

A great deal has already been done to increase the capacity of the port berths and the railroad station of Odessa Port, to increase the intensity and quality of processing the means of transport as well as for accelerating the delivery of freight to consumers. The establishing of large grain facilities at the third and first areas has made it possible at two berths to provide an average daily loading of 400 railroad cars (24,000 tons of grain freight). Reconstruction has been carried out on one other carloading station. The grain facility of the first area located at berth No 7 has been equipped with pneumatic grain transloaders. Jointly with the railroad workers, additional rail tracks have been built and this has made it possible to broaden the front for simultaneous car loading.

Manual labor has been excluded in the transloading of animal carcasses. In the entire production chain, this work is done with machinery and equipment outfitted with special load-seizing devices.

Two deep-water berths have been put into service. Some 20,000 m^2 of warehouse area have been built. By the end of the 11th Five-Year Plan an installation will be developed for transloading containers and trailers.

The industrial-transport complex continues to develop and this provides for the delivery of baled urea from the Cherkassy Azot [Nitrogen] Production Association via Odessa Port to the nations of Southeast Asia. Loading facilities have been established making it possible to significantly accelerate the transloading of cargo on the shipping lines linking our nation with a number of the CEMA member nations as well as with the developing states.

The port workers have done good work in 1983. The economic cargo turnover exceeded the planned and was 28.6 million tons. The gross intensity surpassed by more than 2-fold the level achieved in 1982, while net intensity rose by 15.5 percent and was almost 3.5 tons per vessel per day. More than 1,000 vessel-days of anchoring time were saved for the fleet.

Over the year around 142,000 railroad cars were loaded and unloaded. Here the time spent as an average per car was reduced by 16 minutes. There was a noticeable increase in labor productivity, the cost of processing 1 ton of freight was reduced and the volume of direct-type shipments increased.

10272
CSO: 1829/34

BELGOROD-DNESTROVSKIY PORT LEVELOPMENT

Moscow MORSKOY FLOT in Russian No 8, Aug 84 pp 6-7

[Article by A. Levit: "A Harbor in the Estuary"]

[Excerpts] Around 500 vessels from 22 nations of the world annually arrive, are processed and leave the Belgorod-Dnestrovskiy Commercial Port for long trips.

On 29 March 1971, the port received the first vessel, the Bulgarian diesel vessel "Ropotamo."

At present the waters and modern concrete piers of the ancient city (the history of Belgorod-Dnestrovskiy dates back to the start of the 6th Century B.C.) are crowded with cargo vessels and barges, while the towing tugs toot back and forth. Around 5,000 vessels from 28 countries of the world have been processed since the young port has existed.

The year 1983 brought many changes to the port, related the chief of the Belgorod-Dnestrovskiy Port, V. Baranenko. Many important tasks were carried out. The Odestransstroy [Odessa Transport Construction] Trust put into operation additional railroad track for the switching fleet, two rear railroad spurs 600 m long were built, construction was completed on a railroad scales and repairs were carried out on the crane tracks at berth Nos 5 and 6. Due to these measures it was possible to operate the rolling stock more intensely, to process the fleet more effectively and reduce unproductive stoppages.

The results of port operations in 1983 are good. The cargo processing plan was fulfilled ahead of time, on 20 December. Some 53,000 tons of national economic freight were processed above the annual plan. The indicator for handling freight by direct shipping was significantly surpassed. As an average the time for processing each railroad car was reduced by 12 minutes. As a result unproductive stoppages were reduced by 1.7-fold in comparison with 1982; labor productivity rose by 1.3 percent while profit increased by 2.7 percent.

The port workers have also achieved good results in 1984. The 5-month production plan for cargo handling has been fulfilled by 104.7 percent while the cargo shipping plan was fulfilled by 104.5 percent.

The port has developed a special system making it possible to monitor the quality of work effectively and unerringly. Each day the centralized information group draws up an operational summary reflecting the port's production activities. It shows the transloading operations on vessels, the processing of railroad cars, total cargo turnover, the position of the port-fleet vessels and even the reporting to work of the port workers. The summary also gives the reasons for the nonfulfillment of the items in the shift-daily plan and vessel stoppages if such have occurred and comments are entered by the dispatcher on duty, the chief of a loading area, a safety engineer and other responsible officials when these proposals are aimed at improving the operations of all elements.

It must be pointed out that since the organizing of a unified brigade, instances of stoppages have declined by 4-5-fold, the quality of the processing of ships and railroad cars has improved and their handling time has declined.

...Here the warm estuary water laps the shore quietly. Here the concrete ends and the long voyages of the ships commence. Work is in full swing at all the berths, but particularly at the new 162-m one. It was put into service not so long ago by the Order of Lenin Chernomorgidrostroy [Black Sea Hydraulic Engineering Construction] Trust. The purpose of the berth is special: to transship by water the freight and equipment destined for the Odessa Nuclear TETs, one of the basic construction projects of the Ukraine during the 11th Five-Year Plan.

In addition to the berth itself, the construction workers are completing the entire range of planned projects: they will lay the access tracks, prepare the appropriate warehousing and service facilities and install a power substation.

During the years of its existence, the port has grown from an auxiliary system into an independent one capable of handling up to 4 million tons of import-export cargo a year. During the development of the port, stable cargo flows have been formed including: coniferous lumber and aspen beams for export, citrus, canned goods, fresh tomatoes, various types of metals for the automotive industry and chemical cargo for imports.

Located in the mouth of the Dniester, a river which flows through all of Moldavia, the port can provide great service to the fraternal republic. At present, rail transport ships into Moldavia around 1 million tons of lumber from the Volga-Kama Basin, more than 0.5 million tons of metal from Zaporozhye and Zhdanov as well as grain, equipment and much else. In the reverse direction flow 800,000 tons of canned goods, 1 million tons of powdered lime, gypsum and grapes. Around 20,000 acutely-scarce railroad cars are assigned to handle these shipments.

The port chief V. Baranenko, his deputy for operations V. Oleynichenko, the head of the Laboratory for Integrated Transport Problems of Chernomorniiproyekt [Black Sea Affiliate of the State Planning, Design, and Scientific Research Institute of Maritime Transportation] V. Vakuyev and other specialists have conducted extensive research and shown the advisability of switching a portion of the cargo flow going to Moldavia from rail transport to water, with the transloading of the cargo from seagoing vessels to river ones at the port of Belgorod-Dnestrovskiy. In 1983, in experimental shipping of lumber from the Volga-Kama Basin in transloading it from river-sea type vessels to barges of

the Moldavian Glavrechflot [Main Administration of the River Fleet], it was possible to free around 300 cars.

But specialists and designers are already thinking about a completely new way for developing the port involving the processing of lighters here.

10272
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OPEN ROAD GRAIN UNLOADING AT LENINGRAD PORT

Moscow MORSKOY FLOT in Russian No 8, Aug 84 p 28

[Article by V. Gusev: "The Value of a Foot Beneath the Keel"]

[Text] The Order of Lenin Leningrad Maritime Commercial Port is visited by vessels with a displacement tonnage up to 100,000 tons and up to 250 m long. Escorting them through the sea channel has been and remains a complicated matter. But this question already has a history. It confirms the importance of bold experiments and the value of professional pilot skill.

The length of the Leningrad Sea Channel is 27 miles. It has been cut through the shallow port area, it has curvilinear sections and a closed and open part.

With the increased tonnage and hence the greater size of the vessels, the question has arisen of deepening the channel. But deepening requires the use of equipment and great expenditures. For example, economists have determined that dredging just 0.1 m by the most rational method would cost over a million rubles. Such deepening would not eliminate the main problems. Different solutions were needed aimed at providing safe escorting of large-tonnage vessels through the channel and the sailors turned to the scientists for help.

Research got underway. In the aim of developing a new method for escorting the vessels, the work was done by specialists from the Hydrographic Enterprise of the MMF [Ministry of Maritime Fleet] and Chernomorniiproyekt [Black Sea Affiliate of the State Planning, Design, and Scientific Research Institute of Maritime Transportation]. On the basis of the research data and mathematical modeling, the scientists made valuable proposals to calculate the passable draft with a minimum water depth under the keel of large-tonnage vessels.

A pilot experiment played a major role in the actual introduction of the proposed method. The senior pilots from the Leningrad Port Ye. Sarmentov, A. Bakayev, V. Leonov, K. Denisov, Yu. Lebedev, L. Kuznetsov and their professional comrades devoted to the experiment all their rich experience in escorting vessels in home and foreign waters and their excellent knowledge of the particular features of piloting in their own channel. The captain of the Le ningrad Port F. Podanev and his deputy for pilot operations V. Shuvalov actively contributed to the success of the experiment the results of which were of great benefit to the sailors and port workers.

The time of carrying out the new method coincided with an intense period in port operations. A large amount of bulk cargo had arrived. The piers, the internal roads and the area around the receiving buoy became a place for around-the-clock processing of grain-laden vessels. Firmly incorporated in the cargo working operations was the so-called "unloading stop" (a partial unloading of the large-tonnage vessels at the open roads) for reducing their draft prior to moving through the channel into the port. Highly productive grain transloaders were employed in the unloading stop. Seagoing small-tonnage vessels and "river-sea" class diesel vessels were brought up to the side of the "grain ships" for loading. Nevertheless, the chartered tonnage stood idle waiting to be processed, causing losses. Suffice it to say that a 24-hour stoppage of a large bulk carrier requires the payment of an average of 10,000 dollars to the ship owner.

Many parameters had to be considered by the pilots in taking the large vessels through the channel: the tolerable list and bow-to-stern trim, the number of propeller turns and speed and the operating conditions of the main engine. The weather conditions were monitored for the moment of the move and they studied the nature of the occurring wake in moving through areas of the canal with steep and gentle sides. The draft of the vessel was gradually increased. In studying the particular features of their controllability, the pilots improved their own skill without relying on the meager praise of the captains who along with them experienced many minutes of tension in maneuvering and in selecting a safe speed. Gradually, without harming the navigation season, the new method was tested out in practice, confirming its merits. And the day came when diesel vessels with an 11-m draft traveled through the channel which previously had allowed traffic for vessels with a draft up to 9.8 m. And according to the Standards for the Technical Designing of Seaports, for increasing the passable draft to 11 m, it would have been necessary to deepen the 27-mile channel by more than 1 m, spending 10 million rubles on this.

The Leningrad Port, at present, is working at full capacity. Enormous vessels arrive at its receiving buoy and they begin emptying the holds at the roads. For this reason the method developed by the pilots of taking the vessels through at the limit depth of water under the keel remains in use. The port workers effectively load the outbound vessels to the limit draft and in the loading stop they have an opportunity to involve less auxiliary tonnage and reduce the stoppages of the chartered vessels.

The method has been called a "Leningrad" one in spreading to other ports of the nation. At present, it has been developed in Ilichevsk and Kaliningrad and is being mastered in the ports of all our basins. For the price of a foot of water beneath the keel is growing and runs in the millions.

10272
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BALTIC PORTS BENEFIT FROM INTERSECTOR COORDINATION

Moscow VODNYY TRANSPORT in Russian 30 Oct 84 p 2

[Article by V. Dyrchenko, chief of the Latvian Shipping Company: "The Regional Council Is Operating"]

[Text] The coordinating council of the transportation centers of the Baltic Railroad; the Latvian, Lithuanian and Estonian Shipping companies; and the Kaliningrad commercial port is primarily relevant to the effective innovations that have recently sprung up in the Baltic area. For the first time, all of the largest enterprises, whose interests are woven together in the transportation centers, have taken concrete practical steps to coordinate their work on a regional scale.

Time had shown that questions, which required a collective examination at a higher level than the local transportation center, arose rather often during the work of the partners. The coordinating council is like a competent arbitrator who has been given the right to make decisions in controversial situations. It is objective and impartial and possesses real capabilities for resolving an especially complicated problem and for determining prospects for the future. Its role is great in expanding the socialist competition of the transportation centers, in studying and disseminating the positive experience that has been accumulated by them, and in searching for innovative work forms and methods.

Thanks to the firmly established cooperation of the cooperating partners, the work initiative of the Riga seaport brigade of docker mechanics, which is led by V. Aksyuchits who has received a certificate from the USSR Exhibition of National Economic Achievements, to organize a competition for the maximum loading of railroad freight cars received particularly broad support and dissemination. This initiative, which arose in the largest Latvian center five years ago, has permitted more than 10,000 railroad cars to be freed since that time.

Monitoring of the use of bulk cargo freight cartonnage has been set up in the port of Riga using a computer. In order to free still more boxcars, the collectives of the Latvian Shipping Company and the port of Riga have arranged with the railroad workers to transport and transship chemicals through the

Riga transportation center primarily in containers. In developing the capacities of the first phase of the Riga port container terminal, the sailors, port workers and railroad workers of Latvia have taken effective steps to containerize other freight traffic. For example, it permitted the freight transshipment volume in containers to be increased 2.8-fold during 1983 as compared to 1980. Even higher containerization rates are being achieved in 1984.

Each time that the coordinating council of our region's transportation centers examines the results of the next quarter, not only positive items but also so-called "bottlenecks", whose timely elimination would provide a noticeable effect, are detected.

Whereas, for example, the uninterrupted transshipment of imported goods under any weather conditions has been organized in the Riga seaport, freight cars at times stand idle for a protracted period in other ports because of unfavorable meteorological conditions. During the first 10 months of last year alone, more than 67,000 freight cars above the prescribed norms were delayed by meteorological conditions on the approach lines of the ports. The coordinating council recommended that the directors of the transportation centers study and incorporate the experience of the Riga port workers.

Everything is not going well with the supplying of freight cars to transport imported goods from the ports. These goods often sit on the berths for a long time. The coordinating council is taking steps to cover the critical shortages of rolling stock with its own reserves. Effective help is being provided to those transportation centers where the situation requires immediate interference, and the council requests the assistance of the Ministry of Railways when necessary.

The question of repairing rolling stock within each transportation center is being solved constructively and with a consideration for internal reserves. The initiative of the progressive enterprises of Moscow, who have decided to provide the help they can to the railroad in repairing freight cars and containers, has been supported and disseminated in the Baltic seaports. The shoots of this initiative were detected in a timely fashion by the coordinating council and approved by it. As a result, 819 freight cars were repaired during 1983 in the ports of Riga and Ventspils alone.

Route control and all-relay interlocking has been put into operation at the Ventspils station. This has permitted the dockers to master successfully the capacities of the mechanized complex for transshipping potassium salt and allowed them to commission a second berth for handling grain cargo.

Questions concerning the regulation of the feeding of vessels with highly perishable cargo to the seaports and their supply with refrigerated freight cars began to be solved more effectively after the establishment of the coordinating council for the region's transportation centers. The pool of this type of rolling stock, which exists in the Baltic area, is being used more effectively, considering the mutual interest of all partners. The council is

actively engaged in solving the most important questions on which the safety of transshipping national economic freight and the quality of its handling in the ports and on the railroads depend.

The collectives of the Riga and Kaliningrad transportation centers have excellent results in using the carrying capacity of the rolling stock. Here goods are loaded in freight cars up to the upper permissible mark.

In the port of Tallinn, the loading of much imported freight without the participation of receivers-dispatchers has been set up and the servicing of the entire rayon with its own locomotives and brigades of train make-up men has been assured.

Each enterprise has an opportunity to coordinate its efforts with the efforts of its neighbors, to listen to the collective opinion, to adopt instructive experience, and to determine the main avenue of work in the future. In this is the reliable guarantee of coordinated and fruitful actions by all transport workers to achieve the main common goal: to work more effectively and more harmoniously, outstripping the planned periods-- as the times now require.

8802
CSO: 1829/36

PORTS AND TRANSSHIPMENT CENTERS

LENINGRAD PORT OPERATIONS LACK NEEDED COORDINATION

Moscow VODNYY TRANSPORT in Russian 3 Nov 84 p 2

[Article by V. Yeliseyev and O. Povetkin, VODNYY TRANSPORT correspondents and V. Yurasov, GUDOK correspondent: "Obstacles on the Path of Coordination"]

> [Text] Since the people of Leningrad began to work using a continuous planning schedule for the operation of the transportation center, freight turnover here has grown more than twofold and the times for the passage of cargo have been decreased by 22.5 percent. The daily concern of the seamen, port workers, railroad workers, and motor vehicle operators for increasing the level of the transshipment process is bringing ever greater benefits. This is especially noticeable in the indicators of the center's base enterprise -- the Leningrad commercial seaport which completed the quota for the fourth year of the five-year plan on 20 October. During the three years and nine and a half months, 50 million tons of national economic freight were handled in the port; 49 million tons were handled during the entire last five-year plan.
>
> The figures speak for themselves. However, when we visited the port's berths and the local railroad stations, it turned out that far from all the reserves of the Leningrad transport hub were being fully used. The transportation specialists themselves do not deny this.

... On the morning of 25 October, L. Bogatyrev's brigade of docker mechanics began its shift at eight o'clock. All of the freight cars, which had been sent to the berth -- and there were 21 of them -- were loaded by 1030 hours. They had worked, as usual, at accelerated rates and they were able to continue in that same spirit especially since the station had to send the next batch of empties consisting of 40 freight cars to the berth according to the schedule.

N. Olenev, a unit leader and the deputy brigade leader, told us with chagrin: "We waited impatiently for these freight cars. We stood idle for four hours--and there are 35 people in our brigade.

"We telephoned A. Varlamov, the shunting dispatcher of the Novyy Port station, and we found out that the promised hopper cars had arrived at the station late by these same four hours."

The guilt of the Leningrad-Vitebsk Division of the October Railroad is clear. It primarily lies in the fact that it had not warned the port workers in advance about the delay in supplying empties. You see, Bogatyrev's brigade could have busied itself with other work considering the changed circumstances. However, no one, alas, -- even the Novyy Port station workers -- knew when the empties would arrive. Their arrival was mentioned in the schedule. In actuality, this document was a fiction.

Our newspapers have already raised the question of the need to improve the reciprocal information system. The continuous planning schedule provides for the receipt of reliable information on the arrival of freight cars and cargo several days in advance. Unfortunately, this information arrives in Leningrad's port stations too late and often in a distorted form.

The trouble is that the transport hub finds out about the approach of freight trains only when they are within the boundaries of the Leningrad-Vitebsk Division and in the best of cases -- within the boundaries of the October Railroad.

The absence of accurate preliminary information leads to considerable complications. Here is an example taken from not so long ago -- September. The plan called for the dispatching of 250 hopper cars a day to the Novyy Port station for the loading of grain. The estimate was that they would arrive from neighboring railroads. The planning figures, however, did not agree with reality. The October Railroad received 60-70 grain carriers fewer per day and provided just as many less to the station. The loading was disrupted.

Of course, it was possible and necessary to provide in a timely fashion for the preparation of box cars for the grain. They finally began to prepare them; however, valuable time had been lost. True, there was not quite enough of them at the time to completely insure the grain shipment. However, box cars with potatoes, vegetables and other produce were parked near the berths in this same port. They could have been released to the port workers for loading. However, again-- they did this with a considerable delay.

The lag in loading is now being decreased by the joint efforts of the transport workers. For example, that same Novyy Port station has begun to send 300-350 freight cars to the berths instead of the planned 250. The danger remains, however, that the supplying of empty hopper cars can again be curtailed. If it is, then the participants in the transportation conveyer line have a right to ask: "When can one expect them so that we can prepare ourselves in the appropriate manner and not allow a break down?" Accurate and timely information will help to answer this question.

From year to year, the commercial port invests large resources in improving its technical base. Here, the pool of loading and unloading mechanisms has been almost completely updated. Berths have been expanded, and the length of

the approach spurs has been increased by many kilometers. All-weather grain transshipment has been installed and is operating successfully.. In their turn, the railroad workers have set up all-electric interlocking switches at the stations of Novyy Port and Avtovo; they are using powerful modern locomotives; they have set up radio communications between the shunting dispatchers, train make-up men and engineers; and they are planning to reconstruct the stations. The cooperating partners are using electronic computer equipment to plan the work and teletype communications to accelerate the exchange of information.

A. Bilichenko, the first deputy chief of the Leningrad seaport, says: "Actually, we are doing a great deal to expand our enterprise. Based on its technical equipment, the port is today capable of significantly -- by about 30 percent-- increasing its freight handling volume. Not only a sufficient number of freight cars but also the readiness of the participants in the transportation conveyor line to march in step with the times are necessary for this."

Far from everyone possesses this readiness. Here is an example. A large ocean-going dry cargo vessel had berthed in the port. The holds contained up to 100,000 tons of grain. According to existing medical norms, it should be inspected in layers, every meter, that is, approximately 20 tests had to be taken during the unloading of the vessel. You see, however, the unloading is stopped after almost each test: They are waiting for the results of the examination -- because the powerful unloading equipment extracts this same one-meter layer from the hold more rapidly than the laboratory assistants perform all the required analyses. The account builds up not in minutes but in hours. The dockers wait, the vessels and the freight cars stand idle,...

M. Zubritskiy, a docker and mechanic brigade leader, asks: "Is it really not possible in our age of electronic equipment to invent an instrument which would rapidly determine the quality of the grain not by stages but immediatel for the entire hold"?

What can one answer? Some piece of paper indeed holds the vessel to the berth above any measure like an anchor.

It is possible to mention quite a few other "small details" which are becoming a brake on the path of intensifying the transshipment process. Take the compiling of documents for a loaded freight car. The tackle operators and receiver-dispatchers spend enormous time, filling them out by hand. The freight cars, fettering the port's maneuverability, are parked at the berths until the last dot is placed on each document. Evidently the time has come to reexamine in interested departments such a seemingly important question as the speeding up of the compiling of the documentation using the most modern methods and technical systems for this.

Old debates of many years standing are taking place, for example, between the Ministry of the Maritime Fleet and the Ministry of Railways about the placement of seals on loaded freight cars. Who should attach them? Each ministry contends that it is the partner's duty. Meanwhile hundreds and hundreds of

freight car- and manhours and expensive ship-days are being wasted in the Leningrad seaport alone every day on mutual inspections, reweighings, etc.

The security of the freight, however, is not being fully insured, as before.

It is time for the seamen, railroad workers and port workers to look at this problem not from departmental positions but from a state position and to find a mutually acceptable solution at last.

Here is another problem, which incidentally, could be solved today if one wished. From time to time, pests are found in the grain which arrives in the port on some ship or other. Let us assume that they are weevils. The unloading immediately stops, so to say, until the receipt of further instructions. However, what does it take to receive such an instruction! You see, it is necessary to inform literally every department up to the ministries about each case like this. But what if it is night? Or a day off? Or evening on Friday when everyone is taking a rest? Who will make a competent decision? Consequently, vessels, freight cars and docker brigades stand idle again. Or there are reberthings.

It seems to us that the port workers should have a prepared universal instruction on how to act if pests are detected in grain. They should act strictly in accordance with it, accurately and effectively, without waiting for orders from above.

... It is time to sum up what has been said. Today, the main obstacle on the path to intensifying the transportation process in the Leningrad transport hub is the unequal development of the technical and organizational base of the cooperating partners. The port has considerably outstripped and "outgrown" its partners in these respects and, frankly speaking, is using its actual capabilities by no more than 80 percent. Understanding the situation that has taken shape, the port workers are trying to alleviate the fate of their neighbors somehow. For example, they are repairing box cars, up to 80 percent of which were defective until quite recently due to different malfunctions. Today, they are actively participating in solving the question of speeding up fumigation; they are prepared to set aside an additional berth for this. With all of its technical equipment and high level of organization of production processes, however, the Leningrad port -- and this is quite clear -- is encountering more and more frequently such a problem as a shortage of space. The powerful transshipping complexes seemingly cut the port into sections, limiting to a certain degree the freedom of movement of cranes, loaders and motor vehicles; and they have decreased the area for storing freight. Meanwhile, quite close by, the enormous length of the berthing line of its neighbor -- the port of Lesnyy-- stands empty. The question of transferring even a small part of the cargo to the sea port has been discussed already for a long time and without results.

...Picture to yourself a detachment that is marching in some direction in a single formation. At what speed will it advance? At that speed which the weakest one in the group is capable of. No matter how strong and hardy the

others are, they will not be able to increase the rate considerably until the slow pokes rouse themselves. It is possible, of course, to take part of their burden on one's own shoulders; however, the speed as a result will all the same not be the desirable one. Today, the situation in the Leningrad transport hub reminds one of such a picture. That is why the appropriate ministries and departments have something to think about in order to bring the capabilities of the cooperating partners to approximately the same level.

8802
CSO: 1829/36

POOR COORDINATION CONTINUES TO HINDER PERM PORT

Moscow VODNYY TRANSPORT in Russian 3 Nov 84 p 2

[Article by V. Kirchanov, deputy chief of the port of Perm: "It Is Impossible To Bypass the Mountain"]

> [Text] Why is the shipping of salt being delayed in the port of Perm? It is simply amazing that our so-called salt problem is still a tenacious one. The traffic personnel and economists of the line subdivisions of the Kama Shipping Company and the Sverdlovsk Railroad have solved it for many years in a row. They have included journalist satirists, and they have tried to examine it through the prism of the interested community; however, a pile is now there -- a pile weighing more than 200,000 tons of Akhtubinsk salt. Like it or not, doubts creep into one's mind: Perhaps, we have assumed a burden that is beyond our strength? Or the cooperating partners from the USSR Ministry of Railways do not have a reserve of rolling stock to move the above-mentioned mountain of salt?

On 26 October, our workers sent to the USSR Ministry of Railways and the RSFSR Ministry of the River Fleet a telegram filled with bitter bewilderment: "The law of a worker's conscience does not permit us to be silent. A total of 200,000 tons of salt has accumulated in the port of Perm awaiting shipment by railroad. All of the storage areas are filled. Vessels are standing idle awaiting unloading. Instead of fulfilling the plan for supplying freight cars, the directors of the Sverdlovsk Railroad reply with empty promises. The consignees are sending telegrams about the forced stoppage of production. During the first 25 days of October, 1,021 freight cars were sent and loaded instead of 2,000. As a result, our collective is not fulfilling its socialist obligations. Another 100,000 tons of salt will arrive in the port before the end of the navigation period. We request that steps be taken to correct the existing situation immediately. On behalf of the port workers, N. Kuznetsov, leader of the multiple amalgamated composite brigade; A. Gavrilyuk, unit leader; and A. Bushmakov and G. Zyryanov, crane operators".

Yes, the situation in the port has become extremely strained -- during recent years, the workers do not remember seeing anything like this in their lifetimes. Sometimes six and at other times eight "Volgo-Dons" loom for weeks on the Perm roadstead....

In 1979, it was planned that our collective would handle 760,000 tons of Akhtubinsk output; since then, the transshipment volume of salt has grown by almost half as much again -- by 300,000 tons. It is planned to send more than a million tons of this difficult cargo by rail during the present navigation period. Besides volume, however, what has changed for us in comparison with 1979? Nothing. The track facilities of our cooperating partners on the approaches to the port remain as before, not a single square meter of additional storage area has been prepared, and no new capabilities of any type have been put into operation. This means that the increased volume of salt must be passed on only by means of coordinated work on the part of the cooperating types of transport. Scientific research shows that we can manage no more than 800,000 tons of this cargo under the optimum version. During the present year, the port workers have already loaded 760,000 tons -- the 1979 amount -- and, having a supply of 200,000 tons, they are preparing to meet the arriving 20 "Volgo-Dons".

At all times, voices are ringing out today: "Unload at the unequipped bank". You see, however, it is necessary to be sensible. What bank will support this load? Who will provide a guarantee that it will not flow together with the salt?

The port collective, the initiator of the basin-wide socialist competition to fulfill the transportation plan ahead of schedule, has accumulated rich experience in the rapid handling of rolling stock. The matter depends on a small item -- on the freight cars which must be processed at high speeds. The railroad workers should be able to avail themselves of this circumstance. However, I repeat, the pile is now there.... It was possible to load successfully all of the above mentioned amounts in those freight cars which were planned to be loaded with salt but which were not sent to the port-- especially since shipments on a direct mixed rail and water line of communication are planned neither in Perm nor in Sverdlovsk....

It was no accident that a meeting of the Central Coordinating Commission for Organizing the Work of Cooperating Types of Transportation was held in Moscow on 18 September of this year. Here, after the report of T. Gavrilov, the chief of the port of Perm, and T. Bodanovich, the chief of the Sverlovsk Railroad, a decision was adopted to establish a point for preparing freight cars for salt in the Perm branch of the railroad and to supply the river workers with rolling stock in the planned amount. Everyone was happy: Finally, headway will be made in the matter.

The happiness, however was premature. We received no more than 50 freight cars a day from 20 September to 20 October when the average daily norm for sending them was 80. During the first 20 days of October, the demurrage of the fleet because of the absence of rolling stock caused the loss of no more and

no less than 230,000 ton-days. For a comparison--one motor vessel of the "Volgo-Don" type was put out of operation for 46 days. This was during the most critical time of the navigation period. In other words, railroad stock consisting of 72 freight cars were parked for unloading exactly 46 days. Should the railroad workers reconcile themselves to this? How should they regard this demurrage in the Ministry of Railways?

Therefore, it was decided to build a point for preparing rolling stock. It is high time. However, the trouble is that from time immemorial the cooperating partners have placed this vital responsibility on the shoulders of the river workers: You wanted to have freight cars -- take the empty ones; repair them; clean them; and wash the lime, crushed rock, pine bark and metal scales from them. It is necessary to load a freight car without alkalis; we close them up so that the salt will not fall onto the railroad bed. It is a shame to admit that we are being led. A special brigade, which works at preparing freight cars around the clock, has even been established in the port.

This, however, is -- if you like some sort of way out. It manifests itself in the following. We select 8-10 percent of the freight cars, from which coal has been unloaded and which have arrived in Perm, for the salt. We repair everything that we can, we clean them, we put them in the proper shape, and we dispatch up to 50,000 tons of salt during the navigation period.

We are approaching the solution of the problem using the forces and resources of the port workers and consignees. Once, we contemplated carrying out a good plan -- go around in a "revolving door": coal from Kemerovo to Perm and up to 200,000 tons of salt from Perm to Kemerovo's Khimprom. They greeted our initiative with open arms in the Kemerovo party obkom and especially in the management of the Kemerovo Railroad. As was agreed, we sent several express trains consisting of new freight cars... but alas! We are waiting in vain for their return for the third year.

However, you see, there is an example for imitation. A total of 250 new freight cars six express trains -- have been allotted to our most reliable consignee in rovo-Chepetsk (350,000 tons) during the navigation period. It is not surprising that the consignee is being supplied with raw material ahead of time. The freight cars are being freed, and we have time to use them on other branches. In this connection, I would like to recall once again that another "revolving door" is being urgently requested: timber to Perm from Krasnoyarsk and salt for the Krasnoyarsk Synthetic Rubber Plant.

The Perm port workers consider their duty to be the giving of a "green light" to this valuable cargo. The Kama workers understand that the urgent solution of the problem will provide a large economic effect. The matter depends on the cooperating partners.

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HISTORY, ACTIVITIES OF 'INFLOT' AGENCY

Moscow MORSKOY FLOT in Russian No 10, Oct 84 pp 16-17

[Article by G. Maslov, chairman of the Sovfrakht All-Union Association: "Our Calendar, Inflot [the Soviet chartering organization for foreign ships visiting the USSR]--A Half Century"]

[Excerpt] This year will mark the 50th anniversary of the formation of the Inflot maritime agencies. During this time they have serviced hundreds of thousands of foreign vessels arriving in Soviet ports.

In 1924, after the breakup of the economic blockade, the young Soviet Republic entered the world market. Its external trade relations with foreign countries increased each year. In the 1st and 2nd five-year plans the volume of external trade carried by sea grew several times, reaching nearly 17 million tons by 1933. The major portion of Soviet freight in external trade was carried on foreign ships, due to insufficient domestic tonnage.

The "Inflot" Main Marine Agencies (GMA) were founded in the ports of Arkhangelsk, Odessa, Murmansk, Leningrad, Batumi and Vladivostok by order of the Narkomflot [People's Commissar of the Fleet] to service foreign vessels in Soviet ports. They came to possess exclusive agency rights for foreign vessels, representing the interests of their owners before customs authorities, external trade organizations, legal proceedings and other Soviet organizations and departments. The Inflot Maritime Agencies were created as independent organizations with their own budgets and the rights of legal persons.

In the years prior to the war, the greatest amount of foreign shipping called on the ports of Arkhangelsk and Leningrad. Arkhangelsk alone serviced 1,100-1,200 ships annually.

The foreign trade volume dropped at the beginning of World War II causing temporary closing of a number of maritime agencies (in Murmansk, Arkhangelsk and Batumi). In July of 1941 the remaining agencies stopped their activity.

However, by the end of 1941 Inflot Maritime Agencies renewed their efforts in Murmansk, Arkhangelsk and Vladivostok to service Allied ships bearing cargo as the result of agreements between the USSR, Great Britain and the United States.

Maritime agency activity was defined by a party and Soviet government directive on the immediate reorganization of work directed toward military progress, subordinating this work to front line interests and the tasks of rapid victory over the enemy. At agency meetings, worker collectives were told to consider themselves mobilized until the complete defeat of fascism and they swore to devote their efforts and their lives to struggle until the complete defeat of the enemy. In spite of continuous bombing of the Port of Murmansk, agency personnel A. German, R. Lisitsina and N. Prokopenko did not stop their work even for a minute. Many agency employees were awarded government honors for valor and heroism in the battle against the German occupiers.

After the end of World War II, the task became to restore the war-torn national economy in the shortest time possible. Inflot agency collectives bore their share of selfless labor in this national effort.

The restoration of maritime transport shore facilities was basically completed in the first five post-war years. The pre-war level of seaborne cargo was reached in 1950. New ports were opened for foreign vessels and new Inflot agencies were created in Izmail, Reni, Riga, Ventspils and Klaipeda in 1946, Zhdanov in 1956 and in Nakhodka in 1958.

Maritime transport grew at a faster pace. New ports were built and old ones were modernized. The network of Inflot agencies grew apace, appearing in Ilichevsk in 1958, in Tallinn in 1965, in Berdyansk in 1966, in Belgorod-Dnestrovskiy in 1972 and in the Port of Yuzhnyy in 1978.

Thus a modern system of shipping agencies was formed in direct proportion to maritime transport.

At present nearly 15,000 foreign ocean-going and river vessels bearing the flags of over 60 countries enter Soviet ports annually. They are represented by 24 Inflot maritime agencies whose activities cover a wide scope of questions: vessel entry and exit registration; requests for pilots, tugs, launches and moorages; the supply of fuel; provisions and water; organizing handling operations; optimizing time in port, etc. In accordance with foreign shipowner requests, they handle various considerations involving those shipping or receiving goods as well as with those participating in vessel servicing.

In the last 10 years agency services have expanded considerably. Line departments have been formed to book cargos for foreign vessels and estimate and collect freight. Today Inflot agencies handle vessels from 14 foreign lines.

A new type of work for the agencies consists of so-called vessel supervisory servicing. Monitoring cargo operations, supervisors act to reduce vessel demurrage in port and help to correctly organize cargo handling operations. This work is acknowledged by foreign captains who request cargo supervisors from the agencies long before arriving in port.

A great Inflot responsibility is toward vessel crew members for whom free medical care is made available and, if necessary, return passage home is arranged. The agencies assist in the organization of lectures and trips for foreign vessel crew members to inform them of the achievements of the Soviet people as well as their cultural and historical heritage.

In its 50 years of existence Inflot has earned honor and respect among the world's shipping companies. Individual agencies, members of the Baltic International Maritime Conference, contribute in the area of simplifying port formalities on an international scale. Their suggestions are also repeatedly examined at meetings of the International Maritime Organization's Committee on Simplification of Port Formalities.

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BRIEFS

CONVEYER REPLACES PORT CRANES--Leningrad (TASS)--Five port cranes used when unloading sand and rubble will be replaced immediately by a pontoon machine developed by associates at the Leningrad Institute of Water Transport. Yesterday the last batch of metal structures from which the assembly of the mechanical loader is already being carried out at Gorkiy was shipped to the Volga shipbuilders. "About 300 million tons of sand are transported along the country's rivers every year. Dozens of special cranes are engaged in unloading it at the ports. Due to their low productivity, however, the vessels are obliged to stay berthed a long time," said Senior Lecturer P. Artem'yev, director of the work. "Our machine will considerably increase the intensiveness of the unloading work. When the conveyer-boom has been lowered into the hold of the vessel, in an hour it scoops out and conveys to the shore 1500 tons of free-flowing goods. By having made the machine a floating one, the scientists and designers solved yet another important problem: the river workers are able to deliver the goods to places where there is no port equipment. Usually, however, the sand must be unloaded from the vessels and be delivered to the construction site by overland transport. [Text] [Moscow SOTSIALISTICHESKAYA INDUSTRIYA in Russian 6 Jun 84 p 1] 12151

ODESSA PORT'S 'VIETNAMESE' BERTH--Odessa--It is seldom that anyone calls the tenth berth at the Odessa port--the tenth. Usually it is called the Vietnamese--it is from here that vessels leave for the Socialist Republic of Vietnam. The motorship "Sosnogorsk" is processed by the 103rd brigade. The loaders run hither and thither, and the holds are filled with increasingly new loads. "This motorship is processed according to 20 industrial charts," says shift stevedore Aleksandr Zhilenkov, "the work methods must be changed five times during a shift. The brigade copes with the task very well, however. The dockers know all the ins and outs in warehouse stock-taking, and in the production techniques." ...Mikhail Ivanovich sets out for the railroad stock pulling in. He must hurry: to load into the holds motor vehicle tire casings, carbamide, and equipment which are awaited in Haiphong. The Vietnamese complex--the berth of friendship between the USSR and the Socialist Republic of Vietnam--works at full pressure. [By V. Smirnov] [Excerpts] [Moscow VODNYY TRANSPORT in Russian 31 May 84 p 3] 12151

VOSTOCHNYY PORT PREPARATIONS BEGUN--Nakhodka (TASS)--The suction dredges of the Far East technical fleet have opened the summer navigational period. They are deepening the water area in the Vostochnyy Port and are cleaning out the navigable channel of the Vanino-Kholmsk ferry crossing and of other ports. "Nature and the ice breakers have helped to begin the navigational period earlier this year than usual," said O. Maslekha, chief of the Dal'tekhflot Administration. "This year the Far East suction dredges are taking over 3 million cubic meters of earth from the sea bottom. This is a record figure for the entire period of existence of our commercial fleet." The main work is at Vostochnyy Port, where approaches are being laid to the container terminal under construction. A large amount of work is to be done at the ports and port centers of Kamchatka and Sakhalin. [Text] [Moscow VODNYY TRANSPORT in Russian 7 Jun 84 p 4] 12151

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EFFECT OF BAM ON TRANSPORTATION DEVELOPMENT IN FAR EAST

Moscow IZVESTIYA in Russian 23 Oct 84 p 2

[Article by the IZVESTIYA travelling editorial board composed of A. Druzenko, A. Yezhelev, L. Kapelyushnyy, A. Kleva, B. Reznik, and V. Sukhachevskiy: "In Front Is the Ocean"]

> [Text] The port of Vanino is almost covered with a dense morning fog. Its rhythms deafeningly push their way through the shroud with the noise of the gantry cranes, the gnashing of the winches, and the signals of the truck loaders. The dockers are hurrying to send north everything, which is necessary for the long winter, before the coming of the fierce Sea of Okhotsk storms.
>
> There are consists with timber and coal, which arrive here over the rails of the Baykal-Amur Mainline, in the stream of railroad freight. We saw a smart-looking stand in a local school: "The port of Vanino is the seagate for BAM [Baykal-Amur Mainline]". The neighboring Sovetskaya Gavan and the remote ports of Nakhodka, Vostochnyy and Posyet rightfully compete with Vanino to call themselves this. All of them are connected by rail with the second Trans-Siberian Railroad. BAM's outlet to the ocean creates completely new prospects for organizing the transit of freight and for developing foreign economic relations with the countries of the Pacific Ocean basin. Our discussion today concerns the new capabilities and the problems that are arising in connection with these.

BAM goes to Komsomolsk-on-Amur during its last kilometer, and here, it merges with the old railroads that lead to the ocean. Rails have been laid to the east to the inclement Tatar Straits; and in a southern direction, the route leads to the main Trans-Siberian Railroad and further -- to the maritime shores.

The designers and scientists talk about the special place of the Komsomolsk railroad hub in the structure of the future transportation and economic links. They predict for it an enormous growth in freight shipment volume after the

building of a number of branches on the base of territorial industrial complexes within the area of BAM.

It is clear that it is necessary to prepare for this in good time and to make up for the time that has been lost as it is. You see, the development of the Komsomolsk transport hub has not kept pace with the construction rates of BAM's eastern section. Only one-seventh of the amounts, which have been provided for this, have been assimilated according to BAM estimates.

It has happened that approach lines and affiliated stations were being built chaotically -- usually according to stop-gap schedules -- in Komsomolsk because of a lack of coordination between departments. Enterprises build up their capacities, but their transportation shops remain at the former level. What this leads to is evident in the example of an oil refinery. Here, they reconstructed it and increased the output of products 2.5-fold by this. The freight turnover, naturally, grew the same. Only, they did not build additional approach lines although they were included in the reconstruction plan. You cannot now get near the plant -- everything is crammed with tank cars which wait for a long time to be loaded and unloaded.

There is also the following question. Why do they transport pulverized slag through the city by freight cars from the Amurstal plant to the river port? The distance is only three kilometers. Motor vehicle transport would have been able to accept this cargo for a long time if the Amurstal directors had been concerned about access to the slag grinding equipment. They also have no time to lay several kilometers of fuel oil pipeline from the neighboring oil refinery. That is why several thousand tank cars chase between these enterprises every year....

At the beginning of the present year, the union Gosplan and Gosstroy approved a general transportation schedule for the Komsomolsk industrial base. Large resources -- more than 40 million rubles -- were allotted for the construction of the approach lines and railroad departments of industrial enterprises. However, there is no single master for this money; it is divided among the different departments.

Let us consider the meaning of the words -- transportation hub. A hub! A single unit. Thus, is it possible to break it up into its component parts -- according to the number of enterprises in the city, and to organize it depending on departmental ambitions? Here is the opinion of M. Tishchenko, chairman of the Komsomolsk-on-Amur Gorispolkom, on this matter:

"Internal reserves for increasing the effectiveness of transport have been piled in its organization at the present level. It is necessary to allot special-purpose resources to expand the Komsomolsk transportation hub. The general contractor for their assimilation should be the Ministry of Transport Construction and the customer -- the Ministry of Railways."

It is difficult not to agree with this statement of the question.

Every year, larger and larger shipments test the Komsomolsk-Sovetskaya Gavan railroad section. Freight travels over it to one of the most lively mainline crossroads in the Far East -- the port of Vanino. Sakhalin, the Kuriles, Kamchatka and Magadan oblasts, and a vast area of the Arctic are supplied with everything necessary from here. The first phase of the Vanino-Kholmsk sea and railroad crossing, which provides regular communications between the continent and the island of Sakhalin at any time of year regardless of storms and the ice situation, was commissioned more than 10 years ago. Next year, the construction of the crossing's second phase will be completed; and not seven, as now, but eleven powerful sea-ferries of the icebreaker type will ply between Vanino and Kholmsk. Freight traffic is growing in the country's northeast and throughout its width -- from Taymyr to the Bering Straits; export deliveries are increasing ....

There is no denying that difficult times await the almost 500-kilometer road from Komsomolsk to Sovetskaya Gavan. This rail route, which is very important for the country's national economy, was constructed during the war years in record time -- 2.5 years. Even now, railway engineers marvel at the bold technical solutions which were applied here at that time. The road travels over rock clamps, climbs steep slopes and loops around rock falls.

The highest pass, which the route crosses, is called the Kuznetsovskiy after Arseniy Petrovich Kuznetsov, a railroad surveyor and builder. He made accurate calculations and proved that it was possible to conquer the Sikhote-Alinskiy mountain range with steam locomotive traction without cutting numerous tunnels through it. The consists travelled over the 30-kilometer ascent, climbing 27 meters higher every kilometer. We were at the crest of the pass, we admired the stunning boundlessness that opened up everywhere, and we thought about how everything, even railroads, must keep up with the scientific and technical revolution. Today's diesel locomotives, of course, are no match for the steam locomotives of the war years. You see, even the consists are now not the same. Trains weighing up to 10,000 tons and up to one and half kilometers long travel on the Far East Railroad. Electronic computers have given recommendations; the railroad must be reconstructed and strengthened in order to bring it to a modern level of transportation. The "rejuvenation" model of the right-of-way, which has been calculated mathematically and accurately, includes the construction of two-way passing sections, the levelling of particularly difficult sections, the lengthening of station tracks.... This work is not only for the immediate future but also for the far future. It will provide rational reserves of capacity to the railroad.

L. Chernykh, first deputy chief of the Far Eastern Railroad, told us: "The reconstruction of the section was included in the draft plan for the 12th Five-Year Plan; however, the Ministry of Railways and the Gosplan department transferred it to the 13th Five-Year Plan although the expected shipment volume during the second half of the Eighties clearly does not correspond to the present technical condition of the railroad."

The stress in economic strategy is being placed on accelerating the region's economic development. However, no matter how we hurry, nothing will ripen

"in advance of the steam locomotive": The development of transportation must occur at outstripping rates. The scientists of the Economic Research Institute of the USSR Academy of Sciences Far Eastern Scientific Center have substantiated the need for a very rapid -- during the 12th Five-Year-Plan -- reconstruction of the Komsomolsk-Sovetskaya Gavan right-of-way in a special purpose complex program.

An analysis, which was done by specialists in the Giprotrans TEI and Dal'giprotrans institutes, shows that the impending considerable stream of in-transit goods to the Maritime ports also requires an increase in the carrying capacity of the southern section of the main Trans-Siberian Railroad. The 645-kilometer branch from Khabarovsk to Ussuriysk, where there is no electrification, is the weak spot, the "Achilles heel", of the railroad. The trains, which arrive from the west using electrical power, are broken up in Khabarovsk; and their weight is sharply decreased because the power of the diesel locomotives is less than that of the electric locomotives. Here is a zone of underwater economic reefs -- losses in speed, time and fuel; an increase in shipping costs....

Meanwhile, the electrification of the Khabarovsk-Ussuriysk route section would not only increase its carrying capacity twofold and rapidly justify the expenses but would also provide an opportunity to have the longest completely electrified railroad in the world stretching from the western boundaries of the country to the eastern ones -- from Brest to Vladivostok. The Ministry of Railways seemingly regards the solution of this task with attention. It has even allotted resources for the construction of traction substations and a contact system for 220 kilometers to the station of Bikin. Further on, electric traction again comes abruptly to an end -- and for an indefinite time: The further electrification of the railroad section has "departed" from the draft plan for the 12th Five-Year Plan.

The scientists are suggesting a reserve alternative for the reconstruction of the main Trans-Siberian Railroad -- the building of a new railroad branch from the station of Selikhino (it is located near Komsomolsk-on-Amur) to the station of Sergeyevka which is located at the outlet to the largest Maritime ports -- Vostochnyy and Nakhodka. The southern BAM -- as this version is called -- can in the distant future raise the reliability and maneuverability of the entire Maritime transportation network. Moreover, it can serve as a base for further expanding railroad lines in the direction of the Pacific Ocean seacoast moving in stages to the bays of Olga, Rudnaya Pristan, Samarga, and De Kastri.

These proposals, however, are -- as the economists say -- beyond the calculating period, somewhere in the next century; but the improvement of the Trans-Siberian Railroad in the southern branch is an urgent task for today.

You will understand especially clearly how urgent it is in the port of Vostochnyy which is called a window opening up onto the ocean. Today, the port, which extends for many kilometers along the horseshoe-shaped picturesque bay of Vrangel, is noted for the highest degree of mechanization in the country-- almost 99 percent-- and for its modern organization of work. Its future is

even more impressive. It is planned to construct more than 40 deep-water berths here. Vostochnyy will then handle up to 60 million tons of freight annually!

Today, the port is not being kept running at full capacity. Consists with Neryungri coal still do not come here in a large number, and the enormous blades of the reclaimer -- a wheel excavator -- send black oil, which has been delivered mainly from the Kuzbass and Chegdomyn into the holds of the vessels.

There is still plenty of room at the container terminal although foreign firms are more and more interested in this economical type of transportation which permits freight to be delivered rapidly across our country from Southeast Asia to Western Europe and back.

(Seiti Fudzita), an important business man who is the director of the (Itotyu) firm and the chairman of the Japanese association of importers, talked to us about the great and deep interest in expanding mutually beneficial trade relations with the USSR.

Mr. (Fudzita) said: "1974 was the most beneficial year for our business. That year, we purchased more than nine million cubic meters of wood in the Soviet Union and constructed approximately two million wooden houses in our country. This became possible under the conditions of detente, mutual understanding and great hopes for peace. Many business people in Japan want to return to former times and to strengthen our economic cooperation even more."

A good aspiration. Under the present complicated international conditions, the Soviet Union has come out with important initiatives aimed at maintaining and expanding economic, scientific, technical, and friendly ties and contacts between countries.

Comrade K. U. Chernenko has pointed out: "We are in favor of a substantial expansion of mutually beneficial business ties between the USSR and Japan. Here, the potential capabilities are enormous. The forthcoming five-year plan in the Soviet Union and the subsequent years will be connected for us with the development of the very rich rayons which adjoin the Baykal-Amur Mainline. We, of course, will find a use for the unique resources of this zone in our national economy. However, we would be ready to think about the participation of other countries, including Japan, in the realization of our plans."

... The IZVESTIYA team visited all sections of the mainline, beginning with its western point. Here is the final point -- Komsomolsk-on-Amur. A second route to the ocean has been opened. It will permit new natural riches to be developed and the delivery time for much national economic freight to be decreased, and it will considerably improve the transportation network of the country's Far East rayons. Even here, however, just as on other BAM sections, we are faced with solving quite a few problems. The more rapidly this is done, the greater will be the gain for our native economy.

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